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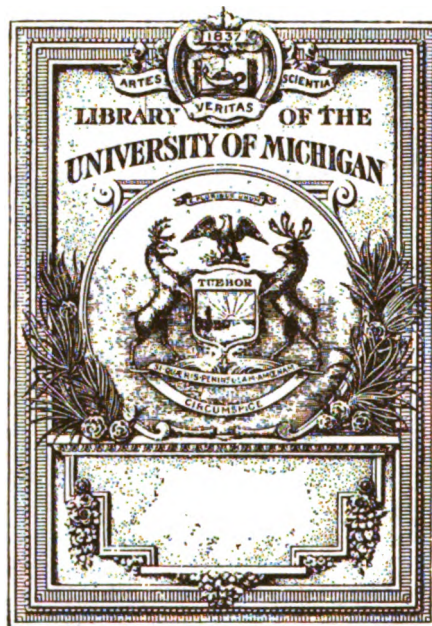
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# ABSTRACTS OF BACTERIOLOGY

VOLUME IV



EDITOR

A. PARKER HITCHENS

1920  
WILLIAMS & WILKINS COMPANY  
BALTIMORE, U. S. A.





VOLUME IV

NUM

ABSTRACTS  
OF  
BACTERIOLOGY

UNDER THE EDITORIAL DIRECTION OF THE  
SOCIETY OF AMERICAN BACTERIOLOGISTS

FEBRUARY, 1920

EDITOR

A. PARKER HITCHENS



*It is characteristic of Science and Progress that they continually  
open new fields to our vision.—PASTEUR*

PUBLISHED BI-MONTHLY  
FOR THE SOCIETY OF AMERICAN BACTERIOLOGISTS BY  
WILLIAMS & WILKINS COMPANY  
BALTIMORE, U. S. A.

THE CAMBRIDGE UNIVERSITY PRESS  
FETTER LANE, LONDON, E. C.

Entered as second-class matter April 30, 1917, at the Post Office at Baltimore, Maryland,  
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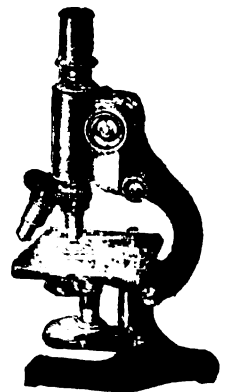
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# SCIENTIFIC PROCEEDINGS OF THE SOCIETY OF AMERICAN BACTERIOLOGISTS

TWENTY-FIRST ANNUAL MEETING, DECEMBER 29, 30 AND 31, 1919,  
BOSTON, MASSACHUSETTS

FIRST SESSION

*Monday, December Twenty-ninth*

## GENERAL AND TECHNICAL BACTERIOLOGY

1. *Abstract of Final Report of the Committee on Characterization and Classification of Bacterial Types.* C.-E. A. WINSLOW, Chairman, JEAN BROADHURST, R. E. BUCHANAN, CHARLES KRUMWIEDE, JR., L. A. ROGERS, AND G. H. SMITH.

As a result of criticisms of the preliminary report of the Committee (J. Bact. 2, 505) made, at, and subsequent to, the 1917 meeting of the Society, the Committee presented a revised classification of the families and genera of the Actinomycetales and Eubacteriales, 38 genera being finally included, with type species for each. In addition to the classification itself the Committee presented an artificial key to the families and genera recognized, and a generic index of the commoner species of bacteria with the names ordinarily used referred to their proper genera under the proposed classification. The Committee recommended that the following names be adopted by the Society as approved genera:

Acetobacter Fuhrmann  
Actinomyces Hars  
Bacillus Cohn  
Bacterium Ehrenberg  
Chromobacterium Bergonzini  
Clostridium Prazmowski  
Erythrobacillus Fortineau  
Leptoteichia Trevisan

Leuconostoc Van Tieghem  
Micrococcus Cohn  
Rhizobium Frank  
Sarcina Goodsir  
Spirillum Ehrenberg  
Staphylococcus Rosenbach  
Streptococcus Rosenbach  
Vibrio Mueller

and that "The Committee on Characterization and Classification of Bacterial Types be discharged and that a new committee on Bacterial Taxonomy be appointed (1) to study and report to the Society from time to time in regard to problems of nomenclature, including such revisions of the nomenclature in the present report as may seem necessary; and (2) to take the proper steps to secure action at the next International Botanical Congress leading to the general ends contemplated in the 1916 recommendations of the Society.

(a) That French, English or German may be substituted for Latin in the diagnosis of bacterial species.

(b) That the date of publication of the third edition of Zopf's Spaltpilze (1883) be considered the beginning of bacterial nomenclature for the purpose of determining priority, with the exception of a definite list of genera conservanda.

(c) That such of the approved generic names specified above as may be found to require such action be recognized as genera conservanda in bacterial taxonomy."

Both the recommendations of the Committee were adopted by the Society.—C.-E. A. W.

2. *Report of Committee on Descriptive Chart.* H. J. CONN, Chairman.

A progress report of the committee, stating the plans made toward a further revision of the chart. The principal points discussed were: whether the best form of chart should be a single sheet or a four-page folder; and how to revise the "group number" in such a way as to retain its good points and eliminate its objectional features.

The report is to be published in full in the *Journal of Bacteriology*.—H. J. C.

3. *The Teaching of Elementary Systematic Bacteriology.* D. H. BERGEY.

The student is given a list of simple and expressive terms to be used in the description of cultures. All the observations and descriptions of cultures are entered in unruled note books about 8 by 10 inches. Simple methods of staining are practiced on different morphologic types of non-pathogenic bacteria. Drawings are made of each organism studied. The student is taught how to transplant cultures from one medium to another and to isolate bacteria in pure culture from mixed cultures by the plate method. The pure cultures are planted on all the usual laboratory media for a systematic study. The observations and descriptions in the systematic study are entered in the student's note book in a definite order. The descriptions are made according to the terminology given. The character and the progressive development in the cultures are illustrated by drawings.—*Author's abstract.*

4. *Reduction Potential in its Relation to Bacteriology.* MANSFIELD CLARK.

The elementary theory of electrolytic oxidation-reduction was reviewed and its application to oxidation reduction indicators was described. The electrode potentials of mixtures of methylene blue, methylene white and of indigo—indigo white in solutions of different pH were determined. From this data the potential of an electrode in a culture of known pH at 80 and at 90 per cent reduction of indigo was predicted. The values found agreed with those calculated. On the assumption that free oxygen in such a culture will come to equilibrium with the reduced and oxidized indigo the pressure of free oxygen corresponding to the found potential was calculated and found to be below a quantity of any physical significance. Whether or not there is a true equilibrium between the oxidation-reduction products in a medium and the free oxygen there remains in the reduction potential of a medium a hitherto untouched phase of anaerobiosis.—*Author's abstract.*

5. *A Contribution to the Mechanism of Disinfection.* C.-E. A. WINSLOW AND I. S. FALK.

The view of Chick and other earlier workers that the rate of dying of bacteria follows the orderly course of a monomolecular reaction has recently been challenged by Brooks who shows that in the case of hemolysis of blood cells and inferentially in the case of bacterial death, the logarithmic values corresponding to the number of surviving cells do not lie on a straight line. He concludes that the shape of the curve is dependent essentially upon two independent variables; (1) the velocity at which the physico-chemical changes are going on in the protoplasm of the cells; and (2) the variations in resistance of the individual cells to the toxic substances present.

From somewhat exhaustive studies of the rate of mortality of colon bacilli in water and salt solutions we are able to confirm Brooks' conclusion as to the shape of the curve, since we find when the rate of reduction is sufficiently slow to permit of careful observation we do obtain an inflected curve rather than a straight line.

We believe, however, that these results can be explained more simply without Brooks' postulate of a specific resistance factor, by the following assumptions:

That the death of a cell is due to a reaction  $A \rightarrow M$  and a reaction  $M \rightarrow B$ . Each of these reactions is of a monomolecular order (and there are probably many more than two; but two will serve for our argument). The velocity of the second reaction at any time is dependent upon the concentration of M, and hence, is dependent upon the velocity of the first reaction. Disinfectants and toxic substances accelerate one or the other of these reactions, and hence lead more rapidly to death. Differences in the ages of the individual cells, we may consider, are accompanied by differences in the concentration of one or the other substance,—and these differences determine the velocity of the toxic reaction. Since the velocity of a reaction is always dependent upon the concentration of reacting substances, such variations from monomolecular reaction curves as have been observed in studies of disinfection, hemolysis and other processes are easily explained quantitatively by the assumption of two, dependent, monomolecular reactions; of different rate; and exactly such curves are figured by Mellor in his "Chemical Dynamics and Statics."—*Authors' abstract.*

6. *The Filtration of Colloidal Substances through Bacteria-Retaining Filters.* W. S. GOCHENOUR AND HUBERT BUNTEA.

The writers have devised a satisfactory process for the rapid filtration of colloidal substances.

The technic involved in the filtration of raw meat juice is: The meat juice is first cleared of coarser particles by centrifugalization, and is then mixed with a small amount of kieselguhr and again centrifugalized. The supernatant fluid is drawn off, mixed with a sufficient amount of kieselguhr to make a paste approximating the consistency of a thin gruel, and poured directly over the filter candle. Best results are obtained by using a minimum amount of vacuum. It is therefore helpful to place the filter candle upright in a mantle, allowing gravitation to minimize the amount of vacuum necessary to draw the material through the filter candle into the vacuum flask. The filtration process should immediately follow centrifugalization. The finally filtered product is capable of complete coagulation. Milk, hemolized erythrocytes and other colloids can be rapidly filtered by this process.—*Authors' abstract.*

7. *The Production and Activity of Proteus Gelatinase in Relation to pH.* MANSFIELD CLARK.

The method of Palitassch and Walbum for the estimation of the activity of gelatine liquefying enzymes was modified and reduced to a procedure capable of mathematical expression. With this method the activity of gelatinase could be numerically expressed.

The curves of activity for the gelatinase of *B. proteus* at different pH values were determined and found to have an optimum at about pH 8.5–9.0. Growth in media of different pH gave optimum production near the pH of optimum activity with considerable reduction of gelatinase production in media of original reaction of pH 6.5. The influence of pH is a very important but still insignificant factor as is shown by the fact that anaerobiosis can shut off production almost completely.—*Author's abstract.*

8. *A Study of Nitrate Reduction by Bacteria.* J. BRONFENBRENNER AND M. J. SCHLESINGER.

The method differs from the usual procedure in that instead of a tube containing nitrates one plants the organism in question into each of two tubes containing nitrates and nitrites

respectively. The basic medium must be selected in each case so as to afford the best growth of the organism which is being studied. To such basic medium one adds in one tube nitrates (sodium or potassium) so as to bring the concentration of salt to 0.015 per cent; to another tube of the same basic medium one adds a small enough amount of nitrites so as not to inhibit the growth. For the most of the commoner bacteria the concentration of  $\text{KNO}_3$  (or  $\text{NaNO}_3$ ) satisfactory for this test was found to be about 0.002 per cent. This quantity is quite sufficient as the test will detect 0.0001 per cent of nitrite. The tubes are planted with the organism and incubated. After 24 hours both tubes are tested for nitrites by the Griess azo-dye method. The procedure for this test has been modified so that one finally obtains the optimum concentration of reagents for the reaction.

**Reagent I:** 0.8 gram sulfanilic acid dissolved in 400 cc. distilled water and 600 cc. glacial acetic acid added.

**Reagent II:** 0.6 gm.  $\alpha$ -naphthylamine dissolved in 1000 cc. glacial acetic acid.

When the test is to be made mix equal parts of I and II and to this mixed reagent add an equal amount of the culture. Then heat to  $70^\circ\text{C}$ ., cool and read. The amount of nitrite can be estimated if a standard scale is prepared. The possible results with this two tube test are:

	I	II	III	IV
Nitrate containing medium.....	+	+	-	-
Nitrite containing medium.....	+	-	+	-

+ in all cases indicating a test for nitrite after incubation.

These are interpreted to mean:

I. Reduction to nitrites but no further.

II. Reduction below the nitrite stage.

III. No reduction.

IV. Either complete and rapid reduction below the nitrite stage or oxidation of nitrite to nitrate. This is decided by a test for nitrate in the tube originally containing only nitrite.—*Authors' abstract.*

#### 9. Limiting and Optimum Reactions for Growth of *B. botulinus* and Organisms Isolated from Food. ARAO ITANO, JAMES NEILL AND MARY E. GARVEY.

This paper presents a preliminary report on the influence of hydrogen ion concentration on *B. botulinus*, and organisms isolated from food at the Massachusetts Agricultural College as to so-called "limiting reactions" and the "optimum reaction" for their growth.

The authors obtained the following results:

NAME OF ORGANISM	LIMITING REACTION (pH)	OPTIMUM REACTION (pH)
<i>B. botulinus</i>	5-11	10
101	4-9	9
301	4-12	5-9
650	4-10	9
651	4-9	9
652	6-10	9
653	6-10	9
654	5-12	9
655	5-11	9
751	5-10	9
752	5-12	9-10
753	5-10	9
754	4-11	9
755	4-11	9
756	4-11	9
850	4-10	9

Temperature  $37^\circ\text{C}$ .

**Future Scope.** The authors are planning to investigate further such physiological aspects of *B. botulinus* as mentioned below:

1. Further investigation of the "limiting reaction" of as many strains of *B. botulinus* as available.

2. Investigation of the "acid death point," the optimum pH<sup>+</sup> for production of toxin.—*Authors' abstract.*

#### 10. The Identity of *Aspergillus oryzae*. CHARLES THOM AND MARGARET B. CHURCH.

*Aspergillus oryzae* Ahlburg was described as the yellow-green mold used in the sake industry of the Orient. As identified by the description of Wehmer, it is a species with fairly sharp limits. The Japanese, however, use the same name for the organism or organisms concerned in the fermentation of soy sauce or shoyu and related industries. Our collection includes many hundreds of yellow-green strains belonging to this group, ranging from the culture of *A. oryzae* distributed by Wehmer to authentic cultures used in the shoyu fermenta-



tion and cultures representing *A. flavus* as interpreted by Brefeld. The Japanese workers have clearly used the name *A. oryzae* in their factories and in their experimental work as covering this entire group, although they recognize that the various members of the group are very different in their appearance and physiological activity. Certain common characters link this series into a natural group. All show the same markings of stalk wall and conidial wall. All show the same general arrangement of fruiting parts. All show a particular yellow coloring matter which is more or less supplemented throughout the group with a true green. Pronounced differences are found in colony appearance, in shades of color, in measurements of stalk, vesicle and conidia. Among these the sake organism represents one extreme, with its long stalks, heads with principally simple sterigmata and large conidia; *Aspergillus parasiticus* of Speare is at the other extreme with short stalks and intense green color. Each strain should be carefully identified either by varietal name or by adequate description before experimental results using it can be properly valued. The name *Aspergillus oryzae* unmodified should be reserved for the organism of the sake fermentation.

Members of this group are universally distributed. *A. flavus* and its allies are consistently found in the soil and widely distributed in foodstuffs, as shown by our collections from Europe, Asia and many places in America. *A. oryzae* in the strict sense is more limited, since we have only occasionally obtained it from sources other than the Oriental fermentation industries.—*Authors' abstract.*

#### 11. Methylene Blue as a Criterion of Anaerobiosis. IVAN C. HALL.

The reduction of methylene blue to its leucobase involves the addition of hydrogen to the molecule and the loss of chlorine. Exposure to the air of a solution decolorized under controlled conditions recalls the color; protection from the air as under conditions of anaerobiosis prevents the return of color. To some extent, therefore, the decolorization of methylene blue is a valid criterion of anaerobiosis. But the factors of anaerobic culture are not all common to the decolorization of methylene blue.

Simple aqueous solutions of methylene blue cannot be decolorized by boiling. Neither acidification by various organic and inorganic acids nor alkalization permits decolorization of the dye on heating. But weakly alkaline solutions containing such carbohydrates as reduce Fehling's solution decolorize readily on heating to drive out absorbed gases. Agar is an exception to this rule and may replace glucose, for example. Gelatin and peptone also permit reduction in alkaline solutions.

There is an inverse quantitative relation between the amount of sugar and alkali required and a direct quantitative relation between these two and the amount of dye that may be reduced. Increasing the sugar permits decreasing the alkali and *vice versa*. With larger concentrations of dye either more alkali or more sugar or both are needed.

Plotting the alkali against the glucose and dividing decolorized tests from those which fail to decolorize, we find that the blue returns most quickly to exposed tests nearest the line. Neutralization of alkalinity by atmospheric CO<sub>2</sub> may prevent repeated decolorization of some of these; there are at least two factors in the return of color CO<sub>2</sub> and O, acidification and oxidation. On the other hand recoloration fails entirely in concentrations of NaOH stronger than N/32.

For comparison in bacteriological work, 2 per cent glucose with N/500 NaOH and 1-100,000 methylene blue is recommended for tests involving liquid media and 2 per cent agar with N/100 NaOH and 1-100,000 methylene blue for tests involving solid media. The dye-glucose and dye-agar solution may be kept in stock but the alkali should be added freshly at the time of use.—*Author's abstract.*

#### 12. A Microscopical Method for Anaerobic Cultivation. JAMES NEILL AND ARAO ITANO.

A simple microscopical method for anaerobic cultivation. The method consists of:

*Apparatus:* (a) An ordinary moist chamber ring which has been ground off  $\frac{1}{4}$  of an inch in height. (b) An ordinary glass ring, for Hansen's single cell culture. (c) A large cover glass.

*Chemicals:* (a) Paraffin of high melting point. (b) Pyrogalllic acid (powder). (c) 10 per cent KOH.

So far the authors have checked the method by using aerobes and anaerobes, and also for the amount of alkaline pyrogalllic acid to be used, and found that satisfactory results are obtained by this method.—*Authors' abstract.*

#### 13. A Device for the Rapid Measurement of Bacteria. PAUL EATON.

Describing a mechanical stage whose movement is brought about by the use of a screw and nut, the screw being actuated by a rather large worm-wheel. The mechanical motions which bring about the movement of the stage are recorded by a counter of the "mile-register" type, such as is used in the automobile speedometer. This is done for the reason that there is less fatigue and less chance of error in reading from such a counter (which may have figures of any desired size) than in reading from a dial or a vernier.—*Author's abstract.*

#### 14. A Modification of the Gram Stain. KENNETH N. ATKINS.

A stable staining solution consists of a 1 per cent aqueous solution aniline sulphate, 3 parts; saturated alcoholic solution Gentian violet, 1 part. The iodine solution contains 2 grams iodine, 10 cc. normal sodium hydroxide solution, water 90 cc. Time for staining and treatment with modified iodine solution, 1 minute each.—*Author's abstract.*

## SECOND SESSION

Monday, December Twenty-ninth

## AGRICULTURAL BACTERIOLOGY

15. *What the Society Can Do to Advance Agricultural Bacteriology.* H. J. CONN.

A paper calling attention to the fact that while there are many workers today in agricultural bacteriology, the number of papers presented at the Society meetings is tending to become fewer each year. The traditional policy of the Society being to maintain a balance between the different technical branches of bacteriology and to give special attention to fundamentals, it would be very unfortunate if the interest of one large branch were lost.

The following seem to be partial causes of the small attendance of agricultural men: The meetings are held in the East near the great centers of medical work, while agricultural bacteriology is distributed widely over the whole country. The duties of many agricultural workers keep them tied to their posts at the time of year when the meetings are held. The present tendency in agricultural work is to give the greatest amount of energy to extension work, and as a result there is less material to present at such meetings as these.

Specific recommendations being difficult to make, it was merely pointed out that it would be of considerable help to agricultural bacteriology if its handicaps under present conditions were fully recognized and efforts made to see that it be well represented in all committee work carried on by the Society.—*Author's abstract.*

16. *Association of Bacillus subtilis and Streptococcus lacticus.* MAX SKIDMORE MARSHALL.

In this study we have observed the influence on lactic fermentation of the growth of *Bacillus subtilis* in milk. The *Streptococcus lacticus* used was isolated from a local college dairy starter. The presence of *B. subtilis* increases the rate of development of the lactic organisms, and a certain ratio of these bacteria in the original inocula seems to give the greatest increase in rate of growth; a lower or higher ratio does not give so rapid a fermentation. This optimum ratio, "*subtilis*: *lacticus*," appears to be very low, that is a very few *subtilis* bacilli give as high a rate, if not a higher, than a greater number.

This matter is studied largely from graphs, basing the fermentation stages on simple phenolphthalein titrations of hydrogen ion concentration. Results are necessarily largely comparative, due to the difficulty in securing accuracy in method in biological work. The courses of development of the two organisms have been observed as two variables with no mathematical course, each influencing the other.

Attempt has also been made to apply the results of the associative effect to the influences on milk involved in clarification,—estimating the proportional part played by association in those influences. It is found that the associative effect is still noticeably felt in clarified milk, but that other factors are involved beside which the difference between the stimulus of the *subtilis* in clarified milk and its stimulus in unclarified milk is not a measurable quantity by our methods.

There would seem to be evidence in the more subtle relationships of the curves which should be of aid in locating the source of the *subtilis* stimulus, and explaining that source, if found.—*Author's abstract.*

17. *Fungi Commonly Found in Soil.* SELMAN A. WAKSMAN.

Soils, rich in organic matter, will be found to contain, if the moisture and temperature conditions are favorable, an abundant fungus growth. Soils with a low organic matter content may show a fungus growth, under special conditions, which are not definitely established as yet, possibly at a high moisture content and at a relatively high temperature. The same species of fungi were found in localities as far apart as Alberta, Canada, Hawaiian Islands, Louisiana, Maine and newly-formed soils from Tortugas Island. This tends to confirm the fact that even those fungi which have not been demonstrated to exist in a vegetative, mycelial stage in all these localities, do produce a vegetative growth. When the conditions become favorable for the growth of these fungi, due to the climatic variations, the mycelium may be destroyed, but the spores, which are much more resistant to adverse conditions, survive, only to germinate and produce a fresh vegetative growth when conditions become favorable. On adding organic matter to the soil and keeping the soil well supplied with moisture, an abundant growth of molds takes place, often forming a mat an inch or more above the surface of the soil. After the molds are allowed to grow for several days, the organic matter is found in the soil in a fair state of decomposition and, as such, may be very useful as fertilizer for vines in the greenhouse and for truck crops in the field.

Among the groups of soil fungi found in the soil are forms parasitic to plants, which may find in the soil only temporary habitats, the extensive groups of *Aspergilli* and *Penicillia*, although very few of these have been demonstrated in the form of vegetative growth, the *Altenaria*, *Cladosporia*, *Chaetomia*, *Rhizoctonia* and others; finally we find the large group of *Mucorales*, whose presence in the soil in the form of mycelium, has been repeatedly demonstrated, particularly the genera *Mucor* and *Zogorhynchus*. In addition to these, a large group of fungi, the *Actinomycetes*, are found in all soils. These have been often improperly classified as bacteria.—*Author's abstract.*

18. *Continued Studies of some Azotobacter.* D. H. JONES.

*Summary and conclusions:* 1. The four varieties of *Azotobacter* studied by us, which were isolated from garden soil at Guelph, Ontario, in 1910, and were reported on in 1913 and 1914, have a complex life cycle.

2. Individual cells following a period of reproduction by fission, may develop reproductive granules or gonidia, within their cell plasma, which, on disintegration of the mother cell are dispersed, increase in size, become typical *azotobacter* short rods, ovals or spheres, and reproduce by fission. The young cells are motile.

3. The reproductive granules vary in size, some being very minute. Attempts to pass them through a Berkefeld filter were not successful. They are positive to Neisser's blue and to Haidenhein's iron haematoxylin stains.

4. Another type of granule, not reproductive and not stainable, possibly composed of reserve food substance, is found associated with the reproductive granules in the mother cell.

5. A "symplastic stage" as described by Löhnis and Smith, has been observed in cultures varying in age from a few days to several weeks. In this symplastic stage aggregations of cells coalesce, the cell walls appear to break down and the plasma of the various cells intermingles, with the resultant production of regenerative granules varying in size from very minute bodies, scarcely discernible with the oil immersion lens, to larger forms that are readily visible when stained. Neisser's blue is a good stain for showing up these granules. On emergence from the "symplassm" these granules grow into young *azotobacter* cells and reproduce by fission.

6. Varieties 1 and 2 in cultures up to 14 days old on Ashby's agar produce large capsules; Variety 3 produces only small capsules and Variety 4 produces no capsules.

7. All four varieties are motile in young cultures on Ashby's agar or in Ashby's solution.

8. In cultures more than 14 days old, large, spherical, thick-walled cells are common. In Varieties 1, 2 and 4 these occur in irregular groups; in Variety 3 they occur in tetrads and sarcina packets. These appear to be resting cells or arthrospores, as at this stage multiplication by fission appears to have ceased for the time being. On transference to fresh media these thick-walled cells germinate, the cell plasma emerging from the thick wall as a large rod which at once proceeds to multiply by fission; the young cells are motile.

9. Heat-resistant endospores are not produced.

10. Involution forms varying much in size and shape occur commonly in cultures more than 14 days old, in Ashby's solution or on Ashby's agar at 25°C. They are particularly numerous when cultures are grown at 37°C.

11. Some involution forms appear to multiply to a very limited extent by a budding process.—*Author's abstract.*

19. *The Sanitary Quality of Milk as Judged by the Colorimetric Hydrogen Ion Determination.*

L. H. COOLEGE and R. W. WYANT.

This is a study of the rate of change in hydrogen ion concentration of a brom-thymol blue broth solution due to the presence of bacteria and enzymes in 0.1 cc. of the added milk to be tested. The colorimetric hydrogen ion determination is used. The tubes containing broth, indicator and 0.1 cc. portion of the milk to be tested are incubated at 37°C. and hourly observations made to note change in pH readings.

The succeeding changes in pH at the end of one hour, two hours, and up to eight hours are used to divide the samples of milk into 17 classes depending upon the activity of the bacteria and enzymes present and may be used to predict the keeping quality of the milk.

A few of the advantages over methods now in use are given below: (1) The method does not measure the number of dead, inert, or living bacteria present in a sample of milk, but does measure the ability of enzymes or bacteria present to bring about changes; (2) the poorest samples of milk may be picked out at the end of one hour and the best samples given their proper grade at the end of eight hours; (3) the cost of material is one tube of broth for each sample tested; (4) there is no expensive equipment necessary; (5) a trained technician is not required; (6) several hundred samples of milk may be examined each day if the comparator designed by one of us is used.

These advantages should make this method a valuable aid to city milk plants, condenseries, ice cream factories and city, town and village health departments.—*Authors' abstract.*

20. *Experiments in Silage Inoculation.* ZAE NORTHRUP WYANT.

Corn silage placed in experimental silos two feet in diameter and sunk four feet in the ground were employed in these experiments. The silos were inoculated in pairs with various strains of lactic acid producing bacteria, salt in the proportion of 1-80 being added to one silo of each pair. After the fermentation had proceeded for about 4-5 weeks the silage from the inoculated cans was fed to 7 calves, about 10 pounds apiece being given each day. No ill effects were observed. The silage appeared to be very palatable. Samples taken from the interior of the can were plated in acid whey agar and in litmus dextrose agar to determine whether the types introduced predominated or whether they had been subjugated by other types. From the first pair of silos which were inoculated with a combined culture of *Bact. lactis acidi* and *Bact. bulgaricum*, the first organism was recovered without

difficulty, the latter not at all. The organisms which predominated in each silo were short rods in pairs, resembling *Bact. lactis acidii* morphologically, spore-forming rods and a few yeasts, about 50 cultures in all being isolated. Every culture of an organism resembling *Bact. lactis acidii* changed the pH value of the dextrose, lactose or sucrose broth from 7.6 of the uninoculated to about 5.5. In only one culture of a spore-forming rod had the acidity increased beyond 6.4. The acidity of some samples of silage reached a pH of 4.6. A study is being made of the predominant acid types isolated with a view toward using some one or more of these types, if found suitable, for silage inoculation purposes next fall, both in small and large silos.—*Author's abstract.*

**21. Biological Factors in Sugar-Deterioration.** NICHOLAS KOPELOFF AND LILLIAN KOPELOFF.

Employing laboratory-made sugars with films of known concentration with moisture ratios varying from 0.14 to 0.24 it was found that:

An increase in number of mold spores inoculated into sugars (with films of varying concentration) was responsible for an increase in deterioration.

A decrease in concentration of the films surrounding the sugar crystals was responsible for an increase in deterioration.

Because of the commercial importance of predicting the keeping quality of sugars.

A table is presented showing the deterioration which may be expected from a definite number of molds in sugars of known moisture ratio.

At moisture ratios of less than 0.18 there is little, if any, deterioration with a mold infection of less than 5000 spores per gram. More than this number of spores induces deterioration. At moisture ratios above 0.18, deterioration occurs with upwards of 100 spores per gram.

At any definite concentration and with an equal number of spores per gram *Aspergillus Sydowi* Bainier is more effective than *Penicillium expansum* or *Aspergillus niger* in its deteriorative activity.

Conclusions similar to those above were reached as result of chemical and bacteriological analyses of Cuban raw sugar stored under normal conditions for 5½ months.—*Authors' abstract.*

**22. The Industrial Application of Enzymes of *Aspergillus oryzae*.** SELMAN A. WAKSMAN.

Aside from the utilization of the strong diastatic and proteolytic properties of the enzymes of *Aspergillus oryzae* in the preparation of food products in the Orient and Taka-Diastase used chiefly for medicinal purposes in this country, these enzymes have still other applications which are of industrial importance.

The enzymes obtained from the cultivation of *Aspergillus oryzae* on the proper culture media are a mixture of various enzymes. They are employed chiefly for their diastatic properties, although the properties of splitting proteins, glucosides and other substances are of importance. As a diastase, or starch-liquefying and sugar-producing enzyme, this enzyme (or group of enzymes) can compete very readily with the strongest plant and animal enzymes, namely, malt diastase and pancreatic diastase. When malt diastase and the fungus diastase are compared as to their action on starch, certain interesting differences which are not yet universally known are observed.

1. Malt diastase hydrolyzes only about 85 per cent of the starch to maltose and glucose, leaving about 15 per cent in the form of starch and dextrins; the *Aspergillus oryzae* enzyme hydrolyzes all the starch, through the dextrin stage, into the sugars.

2. Malt diastase hydrolyzes the starch chiefly to maltose, the *Aspergillus oryzae* diastase hydrolyzes the starch chiefly to glucose indicating that the latter contains a larger amount of the maltase, or maltase splitting enzyme, than the former.

3. When definite amounts of malt diastase and *Aspergillus oryzae* diastase, using a dilute or concentrated form, are compared in their action upon starch, we will observe as follows: If sufficient quantities of the two enzymes are taken to produce the same amount of starch (raw or soluble) used in excess, the same amounts of reducing sugars, the enzyme of *Aspergillus oryzae* is found to hydrolyze 4 to 6 times as much starch as the malt diastase will; in other words, malt diastase is stronger in its sugar-producing power, while *Aspergillus oryzae* diastase is stronger in the liquefying powers of starch.

This fact is important in industries that are chiefly interested in the liquefaction of starch but not in the amount of sugar produced.

1. Textile industry. In the process of sizing of cotton and other fabrics a large amount of starch is added. In addition to the presence of starch in the size it is also present in appreciable amounts in the external layer of the fibre. The process of desizing the fabric which was previously accomplished in the process of boiling the cloth in an alkali solution, can be accomplished by means of a diastatic enzyme, and since the textile manufacturer is not interested in any amount of sugar produced, but only how rapidly and thoroughly the fabric is freed from the starch, the *Aspergillus oryzae* has definite advantages.

2. The clearing of fruit extracts, jellies, etc., which contain some starch, making the extract cloudy.

3. The liquefaction of starch for making soluble starch, dextrins and other starch derivatives.—*Author's abstract.*

## THIRD SESSION

Tuesday, December Thirtieth

## PUBLIC HEALTH BACTERIOLOGY

**23. Bacteriological Methods of Water Analysis Used in the American Expeditionary Forces.** EDWARD BARTOW AND ROBERT EDMAN GREENFIELD.

The responsibility for the purity of the drinking water furnished the American Expeditionary Forces was divided between the Engineering Department, and the Medical Department. The Engineers were responsible for water furnished in large quantities at water points and the Medical Department for the water furnished in smaller quantities as it was taken from water points or from wells not under the control of the Engineers. For the purpose of quality control up to the water points, qualified chemists or bacteriologists usually holding commissions in the Sanitary Corps were detailed to the Engineers for duty. Under the direction of the Senior Sanitary Corps officer a set of standard analytical methods of water analysis covering the bacteriological, and sanitary chemical examination and methods of determining the mineral content, were prepared. Brevity, accuracy, simplicity and the use of a minimum of equipment were points that had to be kept in mind during their preparation. The bacteriological methods were adapted from Standard Methods of Water Analysis. A. P. H. A., excepting confirmation of *B. coli* group was stopped at "partially confirmed." The Standards set by the United States Treasury Department for waters to be used on interstate carriers were used in the interpretation of the results.

Water analyses were made in 11 water analysis laboratories in the Service of Supplies, 6 mobile laboratories in the Army Zone, in some hospital laboratories and in medical department laboratories of some divisions.—*Authors' abstract.*

**24. Some Atypical Colon-Aerogenes Forms Isolated from Natural Waters.** W. F. MONFORT AND M. C. PERRY.

The study of 391 cultures isolated from various waters supports these conclusions:

1. The purpose of sanitary bacteriology of water supplies is distinct from that of systematic bacteriology. Variations from types now accepted as indicative of fecal pollution are so manifold that further study of these variants prior to complete rejuvenation is essential to their correlation with known pollution.

2. The attempt to reduce the members of the colon-aerogenes group to 4 types (non-fecal and fecal aerogenes, cloacae, and fecal *B. coli*) is futile so far as practical application in judgment of water supplies is concerned.

3. There are intermediate forms, of varying methyl red reaction furnishing transitions from one to the other type, which may correlate with their late environment.

4. Difco 1 per cent for 2 days with phosphate and dextrose affords a medium giving at least as fair an approximation to the discrimination of aerogenes from *B. coli* as does the 0.5 per cent Witte-phosphate-dextrose medium (5 days) of Standard Methods, 1917. The methyl red reaction of organisms requires further study and development before this can be regarded as a discriminative character.

5. The methyl red reaction, whether carried out with Standard Methods broth or with 1 per cent Difco broth, correlates but imperfectly with the Koser uric acid reaction (which seems to be discriminative of aerogenes).

6. The aerogenes characters, adonite—, and adonite+ are of slight value as criteria of fecal and non-fecal types.

7. The sugar reactions of members of the larger group can be equally well tested with 0.2 per cent sugars as with 1 per cent sugars of the Standard Methods procedure.

8. The widely varied reactions with sugar divide the group into numerous subdivisions, thus far admitting of no correlation with pollution.

9. The colon-aerogenes group probably includes many spore-forming members other than the four here reported.

10. The Löhnis hypotheses supported by the work of Kellermann and Scales is worthy of more consideration than has apparently been given it.

11. In studies of the group there is need of both statistical data and specific description of variants in waters with full data free from averages and percentages.—*Authors' abstract.*

**25. Studies on the Transformation of the Intestinal Flora.** HARRY A. CHEPLIN AND LEO F. RETTGER.

There appears to be an intimate relation between the chemical composition of the diet, the normally adaptive, acclimatized *Bacillus acidophilus* and the nature of the intestinal flora.

The administration of 2 grams of either lactose or dextrin to albino rats, in connection with a normal, balanced diet, consisting of bread and beef, stimulates the proliferation of *B. acidophilus*, within 6 days, to such an extent as to completely dominate the intestinal flora. The ingestion of 1 gram of either of the above-named carbohydrates results in a deviation from the ordinary mixed flora to one in which about 50 per cent of the organisms are represented by *B. acidophilus*. When, however, the normal, balanced diet, containing also 1 gram



of either lactose or dextrin, is reinforced by the addition of 1 cc., Nephelometer 5, of living cultures of *B. acidophilus*, a complete transformation of the fecal flora from the ordinary type to one strongly dominated by *B. acidophilus* is effected. The same simplification of the intestinal flora may be obtained by the administration, in connection with the basic diet, of 2 cc. of the *B. acidophilus* suspension. These results indicate strikingly the adaptive intestinal acclimatization of this organism.

On the other hand, it has been demonstrated experimentally in this investigation with albino rats, that the ingestion of 5 cc., Nephelometer 5, of *B. bulgaricus* exercised no transforming influence on the intestinal flora. The combination of 1 gram of lactose and 1 cc., Nephelometer 5, of *B. bulgaricus*, in conjunction with the other elements of the basic diet, offered no encouragement to the implantation of that organism. Even when the amount of lactose and the volume of the suspension of *B. bulgaricus* were doubled, the adaptation and acclimatization of that organism in the enteric tract was not affected. In fact, when lactose and *B. bulgaricus* were administered simultaneously, there followed a transformation of the intestinal flora corresponding to the results obtained with the feeding of lactose alone, i.e., the establishment of a fecal flora dominated by *B. acidophilus*, the extent of the development of the latter depending entirely upon the amount of the carbohydrate ingested.

There appears to be a definite relationship between the rate of absorption in the alimentary canal of the carbohydrate and its tendency to affect a simplification of the fecal flora. Thus we found in our experiments that the feces of lactose and dextrin fed rats contained reducing carbohydrates and a flora consisting almost entirely of *B. acidophilus*, while the feces of rats fed on maltose, sucrose and glucose gave negative results with Benedict's solution and manifested no change in the intestinal flora. On the other hand, there seems to be no relation between the hydrogen ion concentration of the fecal material and the intestinal flora of the rats. That is to say, the hydrogen ion concentration limits remain practically constant, whether it be under a diet causing a marked development of aciduric bacteria of the *B. acidophilus* type, or in connection with a basic diet maintaining the ordinary intestinal flora.—Authors' abstract.

**26. Further Studies of Non-lactose Fermenting Organisms—Feeding Experiments on Monkeys.**

NOBLE P. SHERWOOD.

Non-lactose fermenting organisms, closely resembling and perhaps identical with *Bacillus enteritidis*, were fed to monkeys to determine their pathogenicity for these animals. These organisms had been found present in the feces of over 60 per cent of the cases of influenza in several relatively large recurring epidemics during the winter and spring of 1919. Feeding experiments were also tried using several strains of Pfeiffer's bacillus and several strains of Rosenow's green streptococci. One of the monkeys became sick 10 days after being fed 2 strains of these enteritidis-like organisms. A temperature of from one to 2.5° was present for 5 days. A diarrhea developed on the second day and persisted until the fifth day. On the third day a blood culture gave one of the organisms fed. The blood count remained normal. Another monkey became ill and died 2 months after the experiments. At autopsy the enteritidis-like organism used in feeding was recovered in large numbers from the small intestine and the lungs. The anatomical diagnosis was ileo-colitis, muco-purulent bronchitis, broncho-pneumonia with marked edema and emphysema of the lungs. The feeding experiments with Pfeiffer's bacillus and Rosenow's green streptococci were negative. The authors draw no conclusions from their results. They state that if these organisms were not the etiological factor in the epidemics studied that they strongly suggest a filterable virus as a possible cause.—Author's abstract.

**27. A Substitute for Adonite in the Determination of Fecal and Non-fecal Strains of the Colon-Aerogenes Group.** E. L. TREECE.

A peptone gelatine as follows: 12 per cent gelatine, 2 per cent peptone, 0.5 per cent meat extract, tubed and sterilized as for ordinary gelatine was found to correlate the fermentation of adonite in determining fecal and non-fecal strains of the colon-aerogenes group; positive results being indicated by a line of from 4 to 8 bubbles extending down the line of inoculation within 48 hours at 20°C.

Of 60 food strains studied 32 were of the aerogenes type and 20 of these (or 62.5 per cent) were positive in adonite and the same number, 62.5 per cent, produced gas in peptone gelatine. Of the 17 strains of aerogenes that were Voges-Proskauer positive, 82.3 per cent were adonite fermenters and 88.2 per cent gave gas in peptone gelatine. Of 37 known fecal strains studied 36 were negative in adonite and 36 did not produce gas on peptone gelatine.—Author's abstract.

**28. On the Soluble Toxic Substances of the Colon-Typhoid Group.** B. ARONOVITCH.

Toxicity of Berkefeld filtrates of bouillon cultures of *B. suispestifer*, *B. enteritidis*, *B. dysenterias*, *B. paratyphosus* A, *B. paratyphosus* B, *B. typhosus*, *B. coli* and *B. proteus* have been studied. In the case of some of the organisms the toxicity of the filtrates could be demonstrated already in a one-day bouillon culture, while in other cases in the second or third day of cultivation. The toxic products of metabolism of some of those organisms are precipitated by alcohol and ammonium sulfate; they are digested by trypsin, but not by pepsin. Left at 37°C. the filtrates lose their toxicity; however, if previous to incubation they are heated at 65° for 30 minutes, this change does not take place. At room temperature or in the ice-box the toxic filtrates remain without appreciable change for a long time.

In the case of some of the toxic filtrates it was possible to induce in rabbits the formation of antibodies capable of neutralizing the toxic action of the filtrate.

We are continuing the study of these toxic substances in their relation to so-called true toxins.—*Author's abstract.*

**29. Some Observations on the Biological Characteristics of *Bacillus botulinus* and its Toxins.**

PAUL F. ORR.

Many of the characteristics exhibited by 16 strains of *B. botulinus*, which have been studied, differ materially from the accepted description of this organism.

The optimum temperature for growth of all of the strains has invariably been found to be about 37°C. At this temperature an abundant growth takes place within 16 hours and spore formation usually begins within 36 hours; however, the spore formation varies with different strains. When grown in the ordinary dextrose media, such as agar, gelatin and bouillon, *B. botulinus* produces acid, spores are not formed and consequently the cultures soon lose their vitality. In the sugar free media, spores are readily formed and the cultures have remained viable at 37°C. for a period of 2 years.

Of the 16 strains studied originally 11 produced toxin. During the course of a year of cultivation one has entirely lost its ability to produce toxin. Toxin is readily formed at 37°C. by all of the toxic strains, and can be demonstrated after 20 hours of growth.

This toxin is destroyed at 80°C. within 2 minutes. The temperature coefficient of the destruction of the toxin by heat was found to lie between 6 and 8.5 for a rise of 10°C.

*B. botulinus* was recovered quite regularly from the spleen and liver of animals which died following the ingestion of toxic cultures, and also toxin free spores of this organism. The bacillus was recovered occasionally from the heart's blood, the kidneys and the pancreas.

A series of experiments were undertaken to determine the pathogenicity of toxin free spores of *B. botulinus*. Guinea pigs which received relatively large numbers of toxin free spores (heated at 80°C. for 30 minutes) either *per os* or subcutaneously developed symptoms resembling botulism within 48 hours and died usually within from 2 to 4 days. Control animals given protective doses of botulinus antitoxin at the same time as the toxin free spores remained alive. *B. botulinus* was recovered from the spleen and liver in many of these animals after death. In one case botulinus toxin was identified in the brain tissue of one of the dead animals by mouse inoculation and also by the precipitin test.

The results seem to indicate that some cases of botulinus poisoning may be due to a true infection.—*Author's abstract.*

**30. Botulism from Canned Ripe Olives.** RUTH B. EDMONDSON, GEO. G. DEBORD AND CHARLES THOM.

Nineteen hundred and sixty-four cans of olives were examined and ten were tested bacteriologically. All cans which were swelled or "off" in odor showed living organisms. Twenty-seven cans from a "batch" which had caused poisoning cases were tested for *B. botulinus* and the organism was isolated from 7 cans. A factory inspection showed that an uncontrolled brine fermentation might be responsible for extensive contamination and some temperatures were used in processing which were too low to destroy the organism in spore form.—*Authors' abstract.*

**31. The Thermal Death Point in Relation to Time of Some Resistant Organisms.** W. D. BIGELOW AND J. R. ESTY.

Thermal death point in relation to time is defined as the time necessary to destroy a known number of spores at each of several temperatures. The organisms studied were isolated from canned foods which had spoiled owing to understerilization. The temperatures used were from 100° to 125°C. at intervals of 5°. The medium used was the juice expressed from canned peas, corn, spinach, pumpkin, string beans, lima beans, baked beans, beets and milk. A De Khotinsky electric bath with a thermoregulator attachment was used, with Crisco instead of water and the temperature was kept uniform throughout the bath by means of a turbin stirrer.

The following technic was employed: The organisms were grown at the optimum temperature for one week in nutrient broth. One cubic centimeter of this suspension was inoculated into 10 cc. of the medium to be used and heated to 85°C.—15 minutes to kill all vegetative forms. Special culture tubes, 7 mm. (inside diameter) by 250 mm. long and 1 mm. thickness of wall, were sterilized and then inoculated with a suspension of spores of these organisms.

The tubes were then sealed off to within two inches of the surface of the liquid, placed in a Wassermann rack and held temporarily in an ice bath until heated. The rack of sealed tubes was transferred to the oil bath adjusted to the desired temperature and subjected to this temperature for different lengths of time. Upon removal from the bath the tubes were cooled in ice water and held in an ice box until determination could be made on the sterility of these cultures after heating. The initial count was made according to Standard Methods, and the hydrogen ion concentration of the medium was determined colorimetrically.

The organisms studied varied in their resistance to heat. One culture, for instance, containing 50,000 spores per cubic centimeter was sterilized in 16 hours' boiling; 100 minutes at 110°C.; 50 minutes at 115°C.; 10 minutes at 120°C.; 4 minutes at 125°C. The initial number of spores per cubic centimeter affects appreciably the time necessary to sterilize. As the tem-

perature is increased the time of sterilization rapidly decreases. Lowering the temperature 10°C. increases the time necessary for sterilization about ten times.

The hydrogen ion concentration of the medium influences the time of sterilization and must be considered.

This method has worked as successfully with obligate anaerobes as facultative anaerobes. If a more strict anaerobiosis is needed arrangement can be made to introduce an inert gas or apply a vacuum pump during the sealing.

The special culture tube employed was of the smallest diameter that could be conveniently used in order that the time necessary to heat to the center might be ignored.—*Authors' abstract.*

**32. Resistant Bacteria Causing Spoilage in Canned Foods.** J. R. ESTY AND C. C. WILLIAMS.

Forty-six cases of spoilage of canned foods due to the presence of organisms of sufficient resistance to withstand the usual sterilizing processes have been studied during the past year at the Research Laboratory of the National Cannery Association. These cases were distributed as follows: Corn, 11; hominy, 8; milk, 6; peas, 4; spinach, 4; squash, 3; baked beans, 3; pumpkin, 2; string beans, 2; lima beans, 1; beets, 1; sardines, 1.

The organisms causing this spoilage were facultative and obligate anaerobes and were classified according to the range in temperature where growth occurred. The facultative anaerobes fell between (1) 42 and 80°C.; (2) 22 and 80°C.; (3) 37 and 80°C.; (4) 22 and 55°C.; (5) 37 and 55°C.; (6) 37 and 65°C.; and (7) 22 and 45°C. All the five obligate anaerobes isolated were vigorous gas formers and fell into four groups according to the above classification. (1) 45 and 80°C.; (2) 30 and 65°C.; (3) 42 and 65°C.; (4) 22 and 45°C.

The resistance of these organisms to heat varied greatly, ranging from 1½ to 17 hours at the boiling temperature. The true thermophiles, i.e., those developing between 42° and 80°C. are the most resistant to heat. The morphological, cultural and biochemical characteristics were worked out in detail.—*Authors' abstract.*

**33. Heat Penetration in Canned Foods.** W. D. BIGELOW.

A pyrometer was described adapted to use in commercial canning plants in determining the temperature of the center of sealed cans. Heating curves were shown giving the relative heat penetration of typical foods and illustrating the influence of consistency of the product, initial temperature, and size of cans, on heat penetration. The use of rotating sterilizing machines was also discussed and the influence of different speeds of rotation of the can on the heat penetration was shown by means of appropriate curves.—*Author's abstract.*

**34. Bacterial Decomposition of Salmon.** ALBERT C. HUNTER.

An extended bacteriological study was made of salmon held at temperatures between 50°F. and 70°F. until they had reached an advanced stage of decomposition. At 24-hour periods total counts of bacteria were made on the muscular tissue of the back and belly and agar slant cultures were made from the mouth, gills, stomach, ceca, intestines, heart, liver and kidney. Experiments were conducted to determine the effect of thoroughly washing the fish as soon as they were brought ashore.

The results may be summarized as follows: (1) The muscular tissue of freshly caught salmon is sterile; (2) after 96 hours at temperatures between 50°F. and 70°F., the total count of bacteria in the muscular tissue has been found to be as high as 155,000,000 per gram. The high counts obtained are sufficient to explain the decomposition of the tissue; (3) thoroughly washing the fish on arrival at the dock results in lower total counts. The washed fish decompose less rapidly than the unwashed fish; (4) the mouths and gills of salmon contain living microorganisms of various kinds even when fresh from the water; (5) the digestive tract of salmon is sterile when there is no food present; (6) the various organs of the body become infected through the blood vessels usually within 96 hours after the fish are caught; (7) salmon out of water more than 48 hours at temperatures between 50°F. and 70°F. are decomposed to such an extent that they are not desirable as food.—*Author's abstract.*

**35. Comments on the Examination of Canned Salmon.** GEO. G. DEBORD.

It was found in an examination of 6525 cans of salmon that 15 per cent were tainted or putrid; 25 per cent were definitely "off" in odor; and an additional 13 per cent were doubtful. Twelve hundred and eighty-three were examined bacteriologically of which 34 per cent were not sterile. The organisms found were aerobic, sporulating bacteria. There was no correlation between the sterility and the odor of the can.—*Author's abstract.*

**36. The Isolation of Bacteria from Salt and Salted Foods.** WILLIAM W. BROWNE.

The Salt Fish Industry of the United States suffers a large annual loss as a result of the salt fish developing a red coloration when stored under warm, moist conditions. Work undertaken by the United States Bureau of Fisheries indicates that the development of the red coloration is due to the growth of two microorganisms whose probable origin is the sea salt in which the fish are cured.

## Summary

1. The reddening of salted fish is due to the growth of two distinct microorganisms, a spirochete producing an opaque pink coloration and a bacillus producing a transparent red coloration.
2. These two organisms grow in such close harmony that the coloration of fish may vary from the pale pink of the spirochete to the dark red of the bacillus. Likewise their separation into pure culture is very difficult.
3. The optimum concentration for growth forms seems to be saturation, growing well on heavily salted fish, brine, sea salt, and fish agar media saturated with sea salt.
4. No growth appeared on media containing less than 16 per cent sea salt by weight.
5. The morphology of both organisms depends upon the concentration of salt in the medium, varying from the largest forms (14 micra) found in heavily saturated media to the spherical forms (2 micra) found in media of 18 per cent concentration, with all intermediate forms. The amount and character of the colonial growth does not seem to be affected by the varying concentrations of salt.
6. Due to their great sensitiveness to changes in density, staining of these organisms is very difficult.
7. Their optimum temperature for growth is about 50° to 55°C.
8. Both forms are strictly aerobic.
9. Sunlight is not germicidal to these microorganisms as both will tolerate long exposure (8 hours) to the sunlight or electric lights.
10. Influenced by age, low temperatures, and metabolic products these organisms suffer a temporary loss of pigment which is closely associated with the formation of bodies similar to the coccoid bodies of the spirochetes. By transplantations pigmentation, along with vegetative forms, is resumed.
11. All results indicate that the probable source of these microorganisms is the sea salt in which the salt fish are cured and any method devised for the elimination of this reddening from the salt fish industry must be based upon the proper disinfection of the sea salt.—*Author's abstract.*

**37. A Suggested Method for Determining the Bacterial Invasion of Fish.** GEO. D. HORTON AND MAUD MASON OBST.

A method has been suggested and made to work on about 10 varieties of fish to determine whether bacteria enter the flesh of fish through the skin after death. A U-tube made of capillary glass tubing was threaded with a wick, one end inserted in the flesh of the fish and the other in a tube of lactose broth. The fish was immersed in a culture of *B. coli* and the time determined between the beginning of the experiment and the appearance of *B. coli* in the fermentation tube. The skin of the fish was treated differently, being bruised, punctured, and only scaled. When punctured, *B. coli* appeared in the receiving tube soon; when bruised, later; and when scaled, even later. Scaly fish with thick skins in normal condition resisted the invasion of *B. coli* longer than those that had few scales and thin skins.—*Authors' abstract.*

**38. Study in China Blue—Rosolic Acid Indicator.** J. BRONFENBRENNER, M. J. SCHLESINGER AND D. SOLETSKY.

I. Some time ago (J. Med. Research, 1918, 29) we described an indicator for the direct determination of hydrogen ion concentration in growing bacterial cultures. This indicator consists of an alcoholic solution of China blue and rosolic acid. These dyes were selected because of their suitable turning point, broad range and brilliancy of color, and comparatively high resistance to reduction by bacteria. In properly buffered solutions this indicator is colorless in neutral reaction, and shows various degrees of intensity of blue and red color on the acid and alkaline side of the point of neutrality respectively (the colors are thus inverse of those of litmus).

II. Our subsequent studies have demonstrated, however, that the rosolic acid (Merck) which was originally used in making up the indicator, exerted a marked inhibition towards Gram-positive bacteria (see J. Bact., 1920, 5, 1.) We, therefore, attempted to use this indicator in connection with the isolation of Gram-negative bacteria, and found that a medium containing lactose, and the mixture of China blue and rosolic acid were most useful for the isolation of intestinal bacteria. While the colon bacillus is not differentiated on such a medium as distinctly as it is, for instance, on the Endo plate, the advantage of this medium, nevertheless, is very evident on account of the fact that it does not inhibit the growth of *B. dysenteriae*.

III. In order to make this indicator applicable for the study of Gram-positive bacteria as well as Gram-negative bacteria, we attempted to substitute the rosolic acid with some other dye having similar tinctorial properties, which would not exert inhibition upon Gram-positive bacteria. A number of dyes were tried in this connection, and finally we selected the pure sodium salt of rosolic acid (prepared for us by the Harmer Laboratories in Philadelphia). We propose, therefore, to make two indicators—one which we call C R No. 1 containing the China blue and rosolic acid (Merck); this indicator can be used for the isolation of Gram-negative bacteria as well as for the direct determination of hydrogen ion concentration in the growing cultures of Gram-negative bacteria, and the other indicator, C R No. 2 composed

of China blue and the purified sodium salt of rosolic acid (Harmer) which can be used for direct determination of hydrogen ion concentration of growing cultures of Gram-positive as well as Gram-negative bacteria. These indicators were used in the study of a great variety of bacteria belonging to various groups, and so far were invariably found useful.

IV. Since the supply of China blue (Grübler) as well as rosolic acid (Merck) became limited, we were confronted with the problem of finding suitable substitutes among dyes made in this country. Having compared a number of dyes, we selected water blue (Harmer Laboratories, Philadelphia) as a satisfactory substitute for China blue, and rosolic acid made by the Providence Chemical Works, as a satisfactory substitute for the rosolic acid (Merck). Thus at present the C R No. 1 (for isolation of Gram-negative bacteria) is prepared from water blue (Harmer) and rosolic acid (Providence Chemical Works); and C R No. 2 (non-inhibitive) from water blue (Harmer), and sodium salt of rosolic acid (Harmer).—*Authors' abstract.*

#### FOURTH SESSION

*Tuesday, December Thirtieth*

#### COMPARATIVE PATHOLOGY

**39. The Problem of Transmission in Infectious Abortion of Cattle. LEO F. RETTGER.**

The agglutination and complement fixation tests have proven of inestimable value throughout the course of the present investigation. Over 4000 blood samples of bovine animals of all ages were tested by the two methods. Calves were found, without exception, to give the same reactions as the mothers; that is, the calves of positive dams were positive, and those whose mothers were negative gave a negative reaction. After the sixth month all calves were non-reactors, many of them reaching this negative phase by the end of the third month. From the sixth month to the age of sexual maturity (ninth to twelfth month) none of the animals became reactors. The greatest danger from infection exists at the time of sexual maturity and for several months following. Apparently all infection which takes place is from without. If heifers are thoroughly safeguarded against infection from without they remain non-reactors indefinitely. Whether they were reactors or not at the time of birth does not have any bearing on the readiness with which they become infected after maturity.

Repeated efforts to infect calves and heifers from the age of 6 to 18 months and cows of different ages by the feeding of *B. abortus* capsules and milk abundantly supplied with the abortion organism proved a complete failure. On the other hand, recent attempts to infect young heifers of breeding age by intra-vaginal inoculation have resulted in marked changes in reaction to the serological tests, one animal becoming positive to both tests. Whether the apparent infection will be permanent cannot be determined at this early date.

The results of the past 5 years' study very strongly indicate that the male is the most important, if not the only, factor in the transmission of infectious abortion, not because he may be infected himself, but because the disease organism is carried by him from an infected to a hitherto uninfected cow or heifer at the time of breeding. Disinfection of the sheath of the male, therefore, is a very important means of preventing the transmission of infectious abortion. In one particular herd in which there had been a record of 25 per cent abortions, the number of abortions of newly-infected animals was reduced to two during a period when such disinfection was rigidly enforced. Discontinuance of the disinfection for a period of about three months resulted in widespread infection of heifers and numerous abortions.—*Author's abstract.*

**40. The Diagnosis of Anthrax from Putrefying Animal Tissues. W. A. HAGAN.**

In putrefying animal tissues received for diagnosis of anthrax, three difficulties arise: (1) the number of viable anthrax organisms are reduced in proportion to the extent of the putrefaction to the point of complete extinction; (2) there usually occurs in such tissues numbers of anaerobic organisms which have the ability to kill guinea pigs very quickly, as a consequence making this method a diagnosis of no use in many cases; (3) there usually occurs in such tissue, numbers of aerobic spore bearing organisms which morphologically resemble *Bact. anthracis* very closely, both as individual organisms and as colonies. It was found that anthrax colonies could be differentiated quite readily from the anthrax-like by direct examination of the suspected colony under a magnification greater than is generally used. To accomplish this end, the suspected animal material is smeared on the surfaces of agar plates. After incubation the plates are searched for suspicious colonies. On these a cover glass is dropped and the colony margin examined with an oil objective.—*Author's abstract.*

**41. The Bacteriology of the Reproductive Organs of the Cow and its Relation to that of the Meconium of the Calf. WARD GILTYNER AND S. G. BANDEEN.**

*Summary and conclusions:* In this series of 12 pairs of cases of fetus and dam, bacteria were isolated from the uterus in 11 cases and from the meconium in 9 cases.

Since the flora of the digestive tube of the fetus or living calf necessarily changes very soon after the end of intrauterine life nothing was to be gained by making more than the



initial examination of the meconium. As a result of the initial examination of the meconium and the uterus there were 3 of the 12 pairs of cases (uterus and meconium) that gave negative results.

*B. coli communior* and *Staph. pyogenes aureus* were found in only one pair of cases. *B. coli communior* was found in 3 other pairs of cases, making its total appearance in 5 of the 12 pairs of cases or in 6 out of 9 cases of the meconium and 5 out of 11 cases of the uterus that showed any organisms at all. *Staph. pyogenes aureus* was found in a total of 3 uteri and in 4 meconia. *Staph. pyogenes bovis* was found in 2 pairs of cases and in a total of 4 uteri and in 2 meconia. The only other organism significant by its appearance in both uterus and meconium was a streptococcus of high virulence, except that in the pair of cases there may have been an identity of a colon organism and a bacterium.

We are, therefore, inclined to believe that *B. coli communior*, *Staph. pyogenes aureus*, and *Staph. pyogenes bovis* are very apt to occur in the uterus as well as in the digestive tube of the calf in cases of metritis.

Stafseth has found similar organisms in the deeper layers of the mucosa in cases of metritis and has not found *Bact. abortum* in the deeper layers. The significance of his findings will be discussed in detail in papers by himself and by Hallman.

*Bact. abortum* was found only once in the uterus and in no case in the meconium. The significance of the presence or absence of *Bact. abortum* in such cases as are included in this paper with special reference to the history of the cow as regards treatment with live cultures and previous abortions and serum reactions will be considered at another time. Attention is directed, however, to a study of the case reports recorded herein for suggestions in this connection.—Authors' abstract.

#### 48. Bacteriology and Control of Contagious Nasal Catarrh (Snuffles) of Rabbits. N. S. FERRY AND H. PRESTON HOSKINS.

1. Contagious nasal catarrh of rabbits, commonly called "snuffles," may be caused by any one of several microorganisms.

2. *B. bronchisepticus* is responsible for the majority of cases of the ordinary snuffles encountered in this country at the present time.

3. *Bact. leprosepticum* is an important etiological factor, as it was found in a large number of cases and is probably responsible for many of the acute types of the disease which result fatally.

4. *Staph. albus*, probably present in the nature of a secondary invader, was found in practically all cases with purulent nasal discharges.

5. Many other organisms, especially gas producers of the *B. coli* type, were isolated, but in such small numbers as to preclude their relationship to snuffles from an etiological standpoint.

6. The streptococcus is probably not a factor to be considered in infections of the respiratory tract of the rabbit, as it was not found in a single case.

7. The disease can, in a large measure, be controlled with a vaccine composed of the three most prominent microorganisms mentioned above, especially if the conditions surrounding the animals are at all sanitary.—Authors' abstract.

#### 49. Bacillus enteritidis Infection in Laboratory Rats. PAUL R. CANNON.

In an epidemic among laboratory rats, extending over a period of four weeks, 45 out of 52 died. An organism which is culturally and serologically identical with *B. enteritidis* was isolated from the heart's blood of 31 out of 35 rats examined. This organism, when injected intraperitoneally or subcutaneously into other rats, or when fed, caused the death of the rats, and the organism was recovered from the heart's blood and spleen.—Author's abstract.

### FIFTH SESSION

Wednesday, December Thirty-first

### HUMAN PATHOLOGY

#### 44. What is an Influenza Bacillus? T. M. RIVERS.

The question asked in the title can be answered in one sentence. There is only one true *B. influenzae*, existing in name only, and that is the first one grown and described by Pfeiffer, as he or no one else has ever shown any of the subsequent strains to be the same as the first. He did, however, draw the attention of bacteriologists to a group of hemoglobinophilic bacilli which has caused many contentions and hard feelings, and about which no more is known now than nearly thirty years ago.

Thirty-two strains of Gram-negative hemoglobinophilic bacilli from normal throats, 5 strains from the spinal fluids of children with influenza meningitis, and 14 epidemic strains have been studied culturally with the following results: Some are hemolytic, others are not; some produce indol, others do not; some reduce nitrates to nitrites, others do not; some

form an amylase in small amounts, others do not; some make milk-broth-blood slightly acid in 48 hours, others slightly alkaline. None, so far, has fermented any of the sugars, yet it may be shown that some of them can do so under proper conditions.

This group of bacilli can be differentiated from *B. pertussis* by cultural characteristics. The latter can be grown in hemoglobin-free medium, does not form indol, does not reduce nitrates to nitrites and makes milk very alkaline. The reaction in milk alone is enough to separate the two groups.

**Conclusions:** The Gram-negative, non-motile hemoglobinophilic bacilli can be classified biologically by reactions which admit of subdivisions of the group.—*Author's abstract.*

**45. The Aerobic Flora of Dysentery Stools in Adults and Children.** WILBURT C. DAVISON.

This paper is a preliminary report of the study of 900 cultures isolated from the stools of 509 dysentery cases in American troops at St. Najaire Trame in the summer of 1918, and 80 cases of infantile diarrhea in Baltimore, 1 case in South Carolina and 45 in Birmingham, Ala., in 1919.

Of the A. E. F. cases, *B. dysenteriae* (Flexner) was found in 15, *B. paratyphosus* A in 1, and *B. paratyphosus* B in 6.

Of the infantile diarrhea cases in Birmingham which were infectious diarrhea, 69 per cent were infected with *B. dysenteriae* (46 per cent Flexner and 23 per cent Shiga).

Of the 80 cases in Baltimore, 28 were infectious diarrhea (or ileo colitis), of which 82 per cent were infected with *B. dysenteriae* (Flexner). The remaining 52 cases were non-infectious diarrhea and no dysentery bacilli or agglutinins were found.

Twelve per cent of the cultures from children and 29 per cent from adults were late lactose fermenters but all fermentations were complete by the 14th day and no further changes occurred although the fermentations were incubated over 21 days.

The fecal organisms isolated can be divided into 4 main groups (Glynn):

I. Non-lactose fermenters that produce no gas in carbohydrates: (a) *B. typhosus* isolated were true to type; (b) agglutinable Shigas all fermented maltose, late; (c) cultural though inagglutinable Shigas—non-pathogenic; (d) indol forming Shiga (*B. schmitz* and *B. ambigens*); (e) mannite fermenting dysentery agglutinated by American and British polyvalent Flexner sera. Differentiation into Hiss-Russell and Strong by fermentation tests and into British types V, W, X, Y, Z, by agglutination is not clear cut; (f) cultural though inagglutinable Flexners—pathogenicity unknown; (g) *B. alkalescens*, a non-pathogenic inagglutinable Flexner which ferments dulcitate; (h) motile and non-motile *B. fecalis alkaligenes*; (i) *B. pyocyaneus*.

II. Non-lactose fermenters that produce gas in other carbohydrates: (a) *B. paratyphosus* A and B were true to type; (b) 10 distinct types differing from *B. paratyphosus* A and B in one or more characteristics—non-pathogenic; (c) motile and non-motile *B. morgan* No. 1—no agglutination produced in patients—cross agglutination and diversity of type with 4 morgan sera from Dr. Kliger. Some motile and non-motile types agglutinated by same serum. Heterogeneous group—non-pathogenic; (d) *B. proteus*, maltose and non-maltose, rhamnose and non-rhamnose fermenters occasionally in same stool. Non-pathogenic.

III. Lactose fermenters that produce no gas: (a) *B. dispar* or Kruse E—agglutinable strains isolated from ulcerated colon of child dying of infectious diarrhea. Pathogenic; (b) Inagglutinable strains. Non-pathogenic.

IV. Lactose fermenters that produce gas: (a) *B. coli communis*, *communior*, *acidi lactici*, *lactis aerogenes*, *vesiculosus*, *cloacae*, *grunthal*, *B. paracoli* Mair.

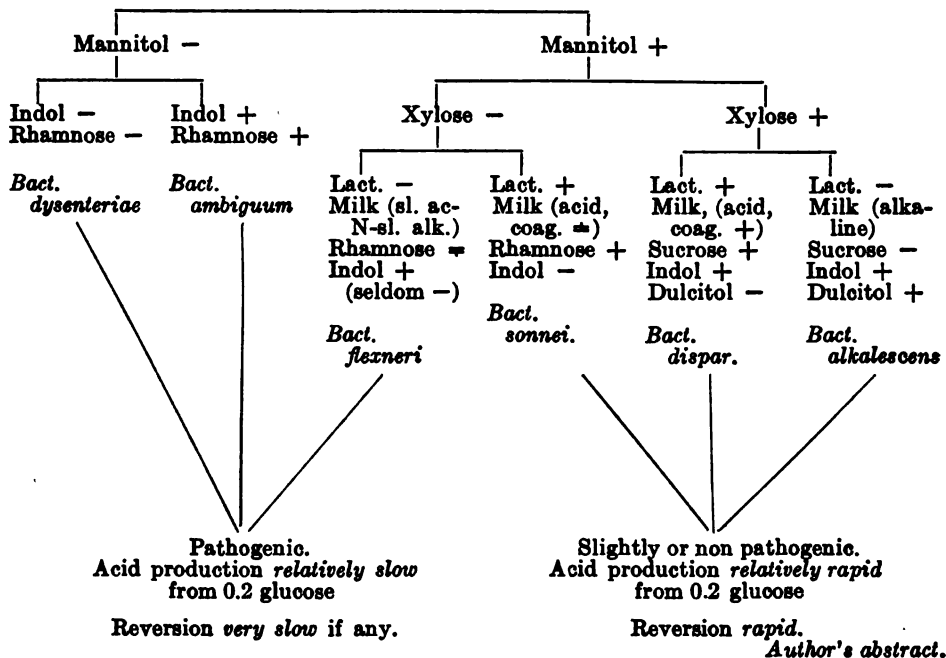
*Streptococcus fecalis* and staphylococci isolated also. **Conclusions:** 1. Ileocolitis and infectious diarrhea should be renamed dysentery in children and made a reportable disease. 2. Aerobic flora of dysentery stools in adults and children are identical.—*Author's abstract.*

**46. Some Differential Characters of the Group of Dysentery Bacilli.** MAX LEVINE.

Acid production from various carbohydrates, and particularly the rate of acid production and reversion in glucose-phosphate-peptone water was observed on 111 strains of *Bact. dysenteriae* and its close allies. Serologic tests indicated that the cultures of *B. dysenteriae* Y obtained from different laboratories were not of the same serologic group.

On the basis of the rate of acid production in 0.2 per cent glucose, 0.4 per cent di-potassium phosphate, 1 to 1.5 per cent peptone (Difco) media, the organisms may be divided into two groups which are quite well correlated with pathogenicity. The pathogenic group forms acid relatively slowly and reverts very slowly, if at all, while the slightly or non-pathogenic group forms acid rapidly and reverts rapidly to an alkaline reaction to brom-cresol-purple and even phenol red.

Six species are recognized: *Bact. dysenteriae* (Shiga-Kruse), *Bact. ambiguum*, *Bact. flexneri*, *Bact. sonnei*, *Bact. dispar*, and *Bact. alkalescens*. The interrelationships and cultural differential characters are indicated in the following scheme.

*The dysentery group*Non-motile, non-gas forming bacilli, resembling *Bact. coli*.47. *The Bacteriology of Chronic Arthritis and Chorea.* JOHN H. RICHARDS.

In this work it was found that: (1) in blood cultures *Streptococcus viridans* was found in 14 cases out of 104 cases; (2) chronic endocarditis was found in 11 cases; (3) a history of acute rheumatic fever was obtained in 12 cases; (4) a history of chorea in 2 cases; (5) foci of *Streptococcus viridans* infection were found in teeth in 50 cases, in tonsils in 40 cases, in ethmoid in 5 cases, in frontal in 0, in sphenoid in 2, in antrum in 4, in prostate in 2, in pyelitis in 1, in salpingitis in 1; (6) complement fixation with *Streptococcus viridans* antigen was found positive in 68 cases; (7) joint fluid cultures demonstrated *Streptococcus viridans* in 4 out of 54 cases; (8) no foci of *Streptococcus viridans* infection were found in 20 cases, and of these 20 negative cases 11 gave positive complement fixation tests. In addition to these 20 cases, there were 9 cases in which streptococcus was seen in the Gram stain of the stool but which could not be obtained in culture for identification, and of these, 7 gave positive complement fixation tests with *Streptococcus viridans* antigen.

In addition 16 cases of chorea have been studied. Altogether in 4 cases no focus of *Streptococcus viridans* infection was found. The complement fixation with *streptococcus viridans* antigen was positive in 13 cases, and negative in 3. The blood cultures showed *Streptococcus viridans* positive in 5, and negative in 11 cases. The feces cultures showed *Streptococcus viridans* in 3 cases, but in the Gram stain streptococci were found in 9 cases. Other foci of *Streptococcus viridans* infection were found in tonsils in 9 cases, teeth in 8 cases, and nose in 5 cases. All cultures were isolated and identified in the manner just described in the bacteriologic studies of chronic arthritis.—A. P. H.

48. *Bacteriologic Peptone and the Production of Diphtheria Toxin and Antitoxin.* LEWIS DAVIS.

I. A résumé of the more important literature on the production of diphtheria toxin is given. This shows wide divergence of procedure. The recent scarcity of Witte peptone and failure of many substitute products to allow of appreciable toxin formation has further complicated the methods employed.

II. The essentials for the routine production of high potency diphtheria toxin are discussed. It is shown that, other conditions being the same, the toxicogenicity of the culture employed may vary within wide limits, according to the source. The necessity of verifying toxin production with any new strain is made apparent.

III. Plain beef infusion bouillon, containing peptone and salt is recommended for toxin production. Preliminary fermentation of the infusion with a culture of *B. coli* is shown to be undesirable. The use of veal infusion in place of beef is unnecessary. Even traces of fat must be avoided in the infusion as it interferes with maximum pellicle formation and thus diminishes toxin elaboration.

IV. A content of 2 per cent peptone with 0.5 per cent of salt in the bouillon has been found to be the most satisfactory.

V. Maximum strength of the final toxin has been obtained when the reaction of the broth comes within the limits of  $\text{pH} = 8.0$  to  $\text{pH} = 8.2$ . A procedure is given for adjusting the hydrogen ion concentration to these values.

VI. Cultivation for toxin production is best made in large flasks, previously inoculated with 24-hour cultures in small "starter" flasks. Incubation for at least 10 days at  $36-38^{\circ}\text{C}$ ., with a 12-day period is to be preferred. Data are presented showing that the hydrogen ion concentration of the medium during growth cannot be used as an index of diphtheria toxin production.

VII. Results are tabulated which have been obtained during the past year in the production of several thousand gallons of diphtheria toxin according to the procedure discussed. Practically 90 per cent of this toxin was of serviceable strength,  $\text{L}_+$  dose = 0.50 cc. or less. Of this more than 78 per cent was high strength, having an  $\text{L}_+$  of 0.33 cc. (M. F. D. = .0033 cc.) or less, and 43 per cent with an  $\text{L}_+$  dose of 0.25 cc. (M. F. D. = .0025 cc.) or less.

The efficiency of this toxin in the routine immunization of horses for antitoxin is shown by records of antidiphtheria serum production during the past year. Nearly 78 per cent of all new horses on this treatment produced serviceable antidiphtheric serum, i.e., having a potency on the first large scale bleeding of 200 antitoxin units or greater. Of the productive horses, 80 per cent gave serum ranging from 200-1000 units, 44 per cent yielded a product from 500-1000 units, and 20 per cent had a serum coming within the very high range from 1000 to above 1600 antitoxic units per cc.—*Author's abstract.*

49. *The Use of Tissue in Bouillon for the Production of Diphtheria Toxin.* G. H. ROBINSON AND P. D. MEADER.

The addition of fresh sterile guinea pig liver tissue to bouillon is of distinct advantage in the production of toxin. From 14 lots of bouillon 12 showed a minimum toxicity of 0.02 cc. Of these 12 lots 2 were toxic in 0.04 cc. although not all were tested in that dilution. The value of the tissue to toxin production may be due to three properties: first, the glycogen of the liver may supply needed food material; second, the tissue may absorb the oxygen in the medium; third, the tissue may supply some substance necessary for toxin production which is found only in fresh tissue.—*Authors' abstract.*

50. *Some Physical and Biological Properties of the Streptococcus Hemotoxin.* P. D. MEADER AND G. H. ROBINSON.

The hemotoxin of streptococcus is a loosely combined organic substance. It is easily adsorbed during passage through a diatomaceous filter and by other substances. It can be destroyed by centrifugalization and shaking. Hemotoxin is formed in quantities proportional to the amount of certain substances present in the medium. The addition of phosphorus compounds to phosphorus-free media restores in part the ability to produce hemotoxin. Cholesterol and lecithin are not concerned in the production of hemotoxin. Albumen, globulin, primary and secondary proteoses, metaproteins and peptone, as separated from culture media by chemical methods, are not the basic substances from which hemotoxin is produced. The essential substance is destroyed by boiling in alkaline solution, by prolonged heating and by adsorption.—*Authors' abstract.*

51. *An Unrecognized Pathway for Bacterial Invasion of the Respiratory Tract.* GEORGE H. SMITH.

Normally, the ciliated, mucus-secreting epithelium is a mechanism competent to protect the lungs against infection by way of the upper respiratory tract. When this epithelium is injured by toxic gas or when the mechanism is otherwise incapacitated, as for example, in aspiration pneumonia, the lumen of the trachea undoubtedly is the pathway traveled by the agent responsible for the pulmonary inflammation. Pneumonia may occur, however, and this is especially true of the lobar type, without demonstrable gross lesion of the upper respiratory tract, and in these circumstances some route other than the above must have been provided.

Experimentally, the introduction of pneumococci by intratracheal instillation or by needle puncture of the tracheal wall through the neck, may result in pneumonia. With either of these methods of inoculation, local damage to the mucosa of the trachea occurs. When the needle method is employed, an opportunity is at hand, not only for infection of the submucosa, but of the peritracheal tissue as well. When the organisms are introduced by insufflation into the rabbit, damage to the mucosa of the larynx or upper trachea can hardly be avoided. In either case, an atrium of invasion for the submucosa of the trachea is provided, and histologically infection of the submucosa is evident at the point of inoculation. From here it may be traced throughout the submucosa of the trachea and larger bronchi to the hilum of the lung by way of the peribronchial and periarteriolar structures into the pulmonary tissue. Infection of the lung occurs under these conditions even though cultures from the lower trachea are sterile.

An abundant lymphatic system can be demonstrated by the injection of India ink into the submucosa of the trachea. This plexus extends from the epiglottis downward as far as the bifurcation of the trachea and connects directly with similar plexi in the submucosa of each bronchus. With further subdivisions of the bronchi, the condition noted above is dupli-

cated. At the points of bifurcation throughout the cartilage-bearing bronchi, anastomotic branches connect the plexi with the periarteriolar lymphatics, and other branches pass directly to the regional lymph glands. Thus a short circuit around the valves of the deeper pulmonary lymphatics is provided.

The distribution and extension of these tracheal lymphatics can be demonstrated equally well by Gram-stained sections prepared from an animal inoculated through the submucosa of the trachea by injection or insufflation of virulent pneumococci. The presence of the organisms shows the distribution of the infection through the lymphatics of the submucosa of the trachea, past the hilum of the lung, into the pulmonary parenchyma. Thus a direct pathway of infection is provided. On the other hand, the manner in which the lymphatic plexi are sharply demarcated at the bifurcations of the trachea and bronchi suggests that this lymphatic system may also serve as a protective mechanism, since, undoubtedly, many of the invading bacteria are, at these points, diverted to the protective regional lymph glands.—*Author's abstract.*

## SIXTH SESSION

*Wednesday, December Thirty-first*

## IMMUNOLOGY

### 52. *Toxins and Antitoxins of B. dysenteriae Shiga.* PETER K. OLITSKY AND I. J. KLIGLER.

An exotoxin and an endotoxin have been separated from cultures of the Shiga dysentery bacillus. The two toxins are physically and biologically distinct. The exotoxin is relatively heat labile, arises in the early period of growth, and yields an antiexotoxigenic immune serum. The endotoxin, on the other hand, is heat stable, is formed in the later period of growth, and is not neutralized by the antiexotoxigenic serum. The exotoxin exhibits a specific affinity for the central nervous organs in the rabbit, giving rise to a characteristic lesion—mainly, hemorrhages, necroses and possibly a perivascular infiltration in the gray matter of the upper spinal cord and medulla. The endotoxin exerts a typical action on the intestinal tract, producing edema, hemorrhages, necroses and ulcerations, especially in the large intestine. A potent antidysenteric serum should contain antibodies against the exotoxin as well as the bacilli themselves and their endotoxin. Such a serum can be produced in horses by injecting live Shiga bacilli intravenously.—*Authors' abstract.*

### 53. *Observations on Pneumococcus Anti-opsonins.* IDA W. PRITCHETT.

The production of anti-hemolysins and anti-bacteriolysins, following the injection into animals of hemolytic and bacteriolytic sera, has been reported by a number of workers. An attempt was here made to produce anti-opsonins in rabbits by injecting them intravenously with immune pneumococcus horse serum. No indication of the formation of anti-opsonins could be obtained when the sera of these rabbits was combined *in vitro* with the pneumococcus horse serum, even after the rabbits had received repeated injections of immune horse serum. On the contrary it was found that after the injected opsonins had entirely disappeared, the serum of the injected rabbits, when combined with the pneumococcus horse serum in the test tube, would greatly augment the opsonization and microscopic agglutination of the homologous pneumococci. This phenomenon was never observed with normal rabbit serum, or when normal horse serum was substituted for the immune horse serum, or when the immune horse serum was combined with heterologous pneumococci. It could be produced only when the serum of rabbits injected with pneumococcus horse serum Types I, II, or III, or with normal horse serum, was combined with immune pneumococcus horse serum Types I or II and homologous pneumococci, but was never observed with pneumococci of Type III, even when low dilutions of the homologous immune serum were employed. It is thought to be a phenomenon dependent on the specific serum precipitating mixtures provided in these cases, and analogous to the similar observations on agglutinins made by others.—*Author's abstract.*

### 54. *Pneumococcus Cultures in Whole Fresh Blood. 1. The Retardative Effect of the Blood of Immune Animals and the Mechanism of the Phenomenon.* CARROLL G. BULL AND LOUIS BAETUAL.

It has been reported by Wright and Heist and his coworkers that the whole fresh blood of man and animals (immune) is highly pneumococidal when the blood is brought into contact with the organisms before coagulation occurs. As is known, pneumococci grow readily in potent immune serum or plasma or even defibrinated immune blood. Hence it was suggested by Wright that chemical changes incident to coagulation were probably responsible for the killing property of the fresh blood.

A summary of the results of experiments on the pneumococidal power of whole fresh blood is given below.

1. It has been shown that the whole uncoagulated blood of immune animals is not as highly pneumococidal *in vitro*, as has been claimed by others.

2. As compared with the blood of susceptible animals, cultures of pneumococci in the fresh whole blood of immune animals show a greatly prolonged latent period and, in a general way, the relative lengths of the latent periods of the cultures correspond to the relative resistances of the animals to infection by these organisms.

3. The blood of animals artificially immunized, both actively and passively, retard the growth of pneumococci in the same manner as the blood of naturally immune animals.

4. Microscopic examination of cultures of pneumococci in immune blood reveals, (1) chain formation, (2) growth in clumps, (3) phagocytosis of the organisms by the polynuclear cells, and (4) that the growth occurs first in the free serum, the clot being invaded later.

5. The retardation of multiplication depends on two factors, (1) opsonization of the pneumococci by the immune serum, and (2) phagocytosis of the organisms by the polynuclear cells; either factor being absent growth readily occurs.

6. Pneumococci multiply in defibrinated immune blood because few phagocytizing cells are present after defibrination.

7. Pneumococci grow in the most potent immune blood after a mechanical destruction of the cells has been effected.

8. It has not been shown that immune blood does not kill a certain number of the pneumococci with which it is inoculated, this point demanding further work.—*Authors' abstract.*

**55. *The Use of the Precipitin Test for the Diagnosis of Food Infections.* J. BRONFENBRENNER AND M. J. SCHLESINGER.**

Ordinary bacteriological examination of suspected food with the view to establishing the etiology in cases of alleged food poisoning are beset with great technical difficulties, and at best are very laborious and time-consuming. We thought of the possibility of greatly simplifying the diagnosis through substitution of immunologic methods in place of bacteriological analysis.

For this purpose we prepare a series of immune sera against a variety of bacteria, which have been at various times incriminated in causing outbreaks of food poisoning, and test by means of these sera the extracts of suspected food samples for the presence of specific bacterial protein.

As the extracts of infected food usually contain very small amounts of specific antigen, it became at once necessary to find methods of concentrating the antigen. As a result of investigations in this direction the most expedient procedure was found to be the concentration of food extracts by means of ammonium sulphate. It was further found that antigen concentrated in this way need not be freed of all the salt by dialysis. When finished it contains only 2 to 3 per cent of the salt, the quantity which is at least five times smaller than that which would interfere with the specificity of the subsequent serum precipitation.

In order to obviate the necessity of testing a given sample against all the specific sera, we suggest the use of a few polyvalent sera which in the preliminary test will show which of the specific monovalent sera should be used in the final test. The diagnosis by this method requires usually not more than 24 hours.—*Authors' abstract.*

**56. *Typing of Bacillus typhosus.* CORNELIA MITCHELL DOWNS.**

In the course of routine diagnostic work it was observed that some of the sera used for identifying typhoid failed to agglutinate certain strains. This fact seemed to indicate that there might be types of typhoid bacilli.

The strains used were from as widely separated sources as possible; 5 were isolated in Kansas, 4 from Europe, 1 from California, the others from various parts of the east and middle west. Culturally they were identical with the exception of 3 strains which gave a deep blue color to litmus milk after a slight initial acidity lasting 4 days, the others remained pink.

Representative strains were selected and rabbits immunized. Cross agglutinations were made using all the organisms against each serum. It was found that they readily fell into 4 groups. Groups I, II, and III are quite distinct, while group IV is agglutinated by both type I and II sera.—*Author's abstract.*

**57. *Preparation and Standardization of Antistreptococcic sera.* N. S. FERRY AND L. W. FISHER.**

The preparation and standardization of antistreptococcic sera, as with other so-called antibacterial sera, has been unsatisfactory and unreliable.

Appreciating that our knowledge of the streptococcus is extremely meager and realizing that the subject of classification is in a chaotic state, the authors have attempted to determine the most satisfactory method of immunising horses against certain strains of the hemolyzing and green-producing varieties and the most practical method of testing the protective value of these sera.

All horses were injected intravenously with virulent cultures of the organisms according to a schedule somewhat similar to that used in the production of antipneumococcic serum.

In order to test the protective properties of the serum, as it was felt that this was the only criterion upon which the values of the serum could be based, two methods of standardization were tried out. The first method, which is the subject of the present paper, was similar to that used for the standardization of antipneumococcic serum; namely, the simultaneous injection of serum and test culture into the peritoneal cavity of the white mouse. The second method, that of the injection of the serum 24 hours previous to the test culture, will be the subject of a subsequent paper.

While the results of the tests, carried out according to the simultaneous method, are in no ways comparable to tests on antipneumococcic serum, it gives evidence of some promise and shows that horses may be safely immunized intravenously with an extremely virulent culture and that the serum can be standardized according to its protective value.—*Authors' abstract.*

58. *The Serological Grouping of Meningococci.* ALICE C. EVANS.

The phagocytic reactions of 63 strains of meningococci were studied. The strains were found to belong to 4 distinct tropin groups, designated R, S, T, and U. A fifth group, Z, included a few strains more or less closely related to the strains of the other groups. The tropin groups did not coincide with the grouping as determined by agglutination reactions. Rabbits were immunized with various representative strains of meningococci and tested with heavy doses of living organisms. The results indicated that the serological distinctions shown by tropin and agglutinin reactions are of no significance with respect to specificity of protection afforded to immunized rabbits under the conditions of the experiment.—*Author's abstract.*

59. *Further studies on the Effect of Urea and Uric Acid on Immunological Reactions.* NOBLE P. SHERWOOD.

In a previous paper the author noted that 0.2 cc. of  $\frac{M}{1}$  urea would fix complement, but that saturated solutions of uric acid had no effect in test tube experiments. He further noted that somewhat smaller amounts of urea seemed to accelerate the hemolytic reaction. In the present paper he compares the quantities of urea necessary to fix human complement and the complement of various other animals. He notes a marked difference but sees no correlation with the blood urea content. Human complement was most easily affected whereas guinea pig complement was affected not at all. He studied the effect of small and large amounts of urea on streptococcus infections in rabbits and also the effect of both small and large amounts upon the blood count and complement content of rabbits. Small amounts seemed to benefit streptococcus infections in rabbits whereas large amounts were apparently injurious.—*Author's abstract.*

60. *The Protective Value of Pneumococcus Vaccination in Mice and Rabbits.* AUGUSTUS B. WADSWORTH.

Although the fact that the inoculation of animals with the pneumococcus develops against subsequent inoculation with virulent cultures an immunity which is specific for the homologous type of pneumococcus is well known, there is no record of a quantitative determination of the degree of immunity that is obtained after vaccination with standardized vaccine. Accordingly a series of experiments with the inoculation of mice with pneumococcus vaccines of Types I, II, and III were made, the results of which it is the purpose of this paper to record.

Miss Thelma L. Franklin, of the laboratory staff, prepared vaccines of pneumococcus Types I, II, and III according to the standard method used in the laboratory and vaccinated mice with these vaccines. In order to test the protection obtained as a result of the vaccination, living, virulent cultures were inoculated seven days after the last dose of the vaccine. Standard cultures of pneumococci of Types I, II, and III are maintained in the laboratory at a virulence which fluctuates considerably from time to time but which invariably kills mice of 18 grams weight in a dose of 0.000001 cc. in less than 36 hours. On account of fluctuation in virulence it is not practical in experimentation with the pneumococcus to determine too exactly the minimal lethal dose, but it is practical to maintain this standard. The dosage of the test virulent culture, therefore, was estimated in multiples of this dose.

*Conclusions:* After one dose of three billion pneumococci, Type I, there was only very slight protection against Type I and none against either Type II or III. After three doses of Type II vaccine there was slight protection against Type II and none against Types I and III. After six doses of Types III vaccine there was no protection against Types I, II, or III. After three doses of Type I vaccine there was no protection against either Type II or III but definite protection against 0.0001 cc. or 100 times the standard fatal dose which the control unvaccinated mouse received. Finally, vaccination with six weekly doses of six billion cocci, Type I, or a total of thirty-six billion cocci, protected against a virulent inoculation of 0.001 cc. but not against 0.01 cc. of the virulent Type I culture.

Definite protection was then obtained against the development of the homologous types of infection when large doses of vaccine were used by the degree of protection that was obtained was not great considering the quantities of vaccine that were used to vaccinate the animals. The parasitism of such highly virulent cultures is so great that the pneumococci develop in the vaccinated animal just as they grow in a test tube of immune serum. The virulence of pneumococci has been found in previous studies to be largely dependent upon its growth energy or vegetative energy which in the animal tissues constitutes parasitisms.—*Author's abstract.*

61. *Preparation and Standardization of Polyvalent Antipneumococcic Serum.* N. S. FERRY AND EMILY L. BLANCHARD.

At the present time the requirements of the Hygienic Laboratory, Washington, for the standardization of a polyvalent antipneumococcic serum, call for a serum that shall protect white mice against Type I pneumococcus only.

It is felt by the authors and many others that a polyvalent serum is an absolute necessity, but that it is essential to have this serum of high enough potency to show a well measured protection against all types. Previous experimenters, however, have not been able to demonstrate sera with high enough protective value against any but the first type to warrant a standardization except for this type, hence the limitations of the Government requirements.

With horses immunized against Types I, II and III and some strains of Type IV, the authors have been able to produce a polyvalent antipneumococcic serum showing a uniform protection against all types equivalent to that required by the Hygienic Laboratory for Type I serum. In standardizing this serum the following protection values have been obtained—of Type I, III and IV a protection against 10 million M. L. D.'s using 0.2 cc. of serum.

In the preparation of this serum horses already giving a high titre of Type I serum were chosen and injected with mixed antigens of all types using the regular schedule of injections as recommended for Type I, slightly modified.—*Authors' abstract.*

62. *Ultraviolet Rays and their Effect on Antigenic Properties. I. Ultraviolet Light and Meningococci.* FREDERICK EBERSON.

Salt solution suspensions of 2000 million meningococci per cc. representing the various types were exposed in quartz flasks to the action of ultraviolet rays generated by an Alpine Sun Lamp. Periods of exposure varied from one-half to ten minutes. Heat effects were ruled out by using a working distance of 36 inches, and the temperature of the flasks did not exceed 38°C. at any time during exposure. The minimal lethal dose of rays was determined by withdrawing after each exposure 1 cc. of the well-mixed suspension and planting on rich serum media. The results were read after 48 hours incubation at 37°C. Growth of the organisms was completely inhibited in 7 minutes for the para, 7½ for the regular and 10 minutes for the irregular strains, respectively. Unexposed controls one hour old, still gave positive growth with transplanted material.

To test the effect of ultraviolet rays on antigenic properties, strains of meningococci were exposed to previously determined subminimal lethal doses of the ray, and sera then prepared in duplicate series of rabbits by intravenous injections according to a modified rapid method of immunization, as follows: Two daily injections were given, followed by a rest period of 6 days after which the third and last dose was injected. The amounts of culture corresponded to 1/10, 1/5 and 1/2 of an 18-20 hour growth on glucose agar with a pH value of 7.4. Six days after the last injections the rabbits were bled and the serum used for agglutination tests set up against untreated living homologous and heterologous strains. The results were read after 18-20 hours' incubation at 56°C., and indicated:

1. A protoplasmic modification of the organisms which evidenced itself in altered agglutino-genic properties of the different strains studied, i.e., a more inclusive and apparently 'non-specific' range of agglutinating affinities, as compared with numerous monovalent serum controls.

2. The presence in supposedly unique antigens of group radicals within the bacterial cell.

3. The probable manifestation of a single protein (antigenic) structure which gives to related organisms the properties by which they may be classified within a certain group.

Another series of agglutinin-absorption experiments was designed to illustrate the nature of the change induced by treating bacterial cells with the ultraviolet ray. Sera prepared with exposed strains were heated at 53°C. for 15 minutes and agglutination series set up on the following day. The sera, diluted 1-50, were added in 5 cc. amounts directly to glucose agar slants of 18 hour cultures of meningococcus, making the suspension to a turbidity of about 8000 million per cc. After thorough suspension, the mixture was placed in centrifuge tubes, incubated for two hours at 37°C., then stored in the ice-chest at 4 to 8°C. for 16 hours. After centrifugation at high speed for 20 minutes the clear supernatant serum was again treated as before. The second centrifugation was prolonged to 25 minutes. Absorbed sera were then tested for agglutinins against homologous types and against those which were agglutinated as a result of the action of the ultraviolet rays on the antigen studied. All series were set up with 18-hour cultures grown on glucose agar and suspended in salt solution to contain 2000 million organisms per cubic centimeter. Each serum was controlled with a non-absorbed specimen which was subjected in parallel to every detail of the experimental conditions imposed by the method. The results were as follows:

1. *Newly-developed agglutinins* resulting from exposure of the organisms to the rays could be removed by absorption with the corresponding strains after which the sera so tested showed no appreciable diminution in antibody content for the remaining strains.

2. Sera containing *newly-formed agglutinins*, if absorbed with the *homologous untreated types* of meningococcus, were materially reduced in agglutinin-content for the *heterologous* strains. The reduction in agglutinins was correlated with the apparent degree of relationship existing among the different strains.

The relation between newly induced immune reactions and those present in the inciting organisms was demonstrated by another series of experiments in which sera prepared with the exposed cultures were absorbed with the *homologous strains modified by identical exposures to the ultraviolet rays*. The results showed that

1. Ultraviolet rays effected a profound change in the bacterial protoplasm as evidenced by the *complete disappearance of newly-developed agglutinins* for the heterologous strains, after absorption tests were made.



2. Certain representatives of a bacterial group are composite antigens which contain cell-radicals common to the other members of the group.

Observations on the immunity reactions of organisms which were treated with ultraviolet rays led to the following conclusions:

1. A few strains, or possibly a single strain of bacteria may suffice for immunizing against a heterogeneous group.

2. Immunity may be built up in animals by injecting organisms which for each dose have been subjected to a correspondingly shorter exposure to ultraviolet rays, thus simulating a process of active immunization which might occur in the animal body under ordinary conditions attending infection.

3. Carefully regulated exposures which exclude the influence of heat on bacterial proteins exert a definite action on the cells and favor agglutinin response while probably diminishing the toxic effect of certain strains.—*Author's abstract.*

## ABSTRACTS OF BACTERIOLOGICAL LITERATURE

### CHARACTERIZATION AND CLASSIFICATION

(See also Numbers 270, 404, 408, 498)

63. *The Results of the Use of Absorption of Agglutinin on the Identification of Strains of Influenza Bacilli.* W. H. PARK, A. W. WILLIAMS AND G. COOPER. *Proc. Soc. Exper. Biol. & Med.*, N. Y., 1919, 16, 120.

The frequency of *B. influenzae* in the respiratory tract of patients suffering from influenza and in the lungs of fatal cases of the disease suggested this organism as the causative agent in the epidemic. In such case the different influenza bacilli from different cases should belong to the same type. Tests were undertaken by taking 20 pure cultures isolated from over 100 cases of influenza, and injecting them individually into different rabbits; each produced a good quantity of agglutinin. Upon making tests with the 20 individual sera against the different strains, it was found "that only four of the serums agglutinated any other strains beyond the ones used to immunize the rabbits." Various control tests were made without altering the results. They conclude that: "This evidence of multiple strains seems to be absolutely against the influenza bacillus isolated being the cause of the pandemic. It appears to us impossible that we should miss the epidemic strain in so many cases while obtaining some other strain so abundantly. The influenza bacilli, like the streptococci and pneumococci, are in all probability merely very important secondary invaders."—L. W. F.

64. *The Cultural Differentiation of Beta Hemolytic Streptococci of Human and Bovine Origin.* J. H. BROWN. *J. Exper. Med.*, Balt., 1920, 31, 35.

In a study of 16 bovine and 12 human strains the author's experiments indicate that, in general, certain cultural characteristics are common to one type and not to the other, although none of the procedures described serves by itself to differentiate streptococci of human and bovine origin with certainty. (1) One cubic centimeter of a fresh young bouillon culture of any of the human strains, diluted 1:20 in 0.85 per cent saline, completely hemolyzed one drop of defibrinated rabbit's blood in 2 hours at 37°C., whereas all but two of the bovine strains failed to completely hemolyze in similar tests. (2) Colonies of all the human strains grown on horse blood agar plates for 18–24 hours, showed a clear, colorless, well-defined, completely hemolyzed zone 2–2.5 mm. in diameter about each colony, whereas the bovine strains (with 2 exceptions) showed a smaller zone, less well-defined or slower in development. (3) Usually the bovine types showed a higher per cent of titrable acid in various carbohydrate serum broths after incubation for one week. (4) Most of the bovine strains had a final hydrogen ion concentration below 5 after 68 hours' incubation in 1 per cent dextrose broth, whereas the human strains were above 5. No consistent differences were noted in coagulation of milk or in reduction of methylene blue.—W. P. B.

65. *On the Cultural Characters of Certain Anaerobic Bacteria Isolated from War Wounds.* R. S. ADAMSON. *J. Path. & Bacteriol.*, 1919, 22, 345–395.

The author studied 15 anaerobic organisms which he isolated from war wounds of patients at the Second Western General Hospital at Manchester. The study included staining properties (Gram's Method) and cultural characteristics on a great variety of media. The organisms were: *B. aerogenes capsulatus* (*B. welchii*, *B. perfringens*); *B. oedematis maligni* (*B. sporogenes*, *B. cadaveris*); *V. septique*; *B. bifementous sporogenes*; central spore bacillus (MacIntosh Type XII); *B. butyricus*; Hibler's Bacillus IX (*B. tertius* of Henry, Rodella III); MacIntosh Type III; *B. tetanoides* (A); *B. tetanoides* (B); an anaerobic diplococcus and other unidentified anaerobic bacilli.—C. G. B.

66. *Pseudo-cellules symbiotiques, anaérobies et photogènes.* RAPHAEL DUBOIS. *Compt. rend. Soc. de biol., Par.*, 1919, 82, 1016.

The photobacteria, organisms which render meat phosphorescent under certain circumstances, possess pleomorphism to a high degree. A single species may assume a variety of forms without losing its power of photogenesis, or, on the other hand, the photogenic capacity may be lost without change of form. The particular strain studied is named *Photobacterium sarcophilum*. The morphology and cultural characteristics are given, but in order to secure the effects described lecithin must be provided in the medium and the growth must be anaerobic.—G. H. S.

67. *An Investigation of the Acid Fastness of Tubercle Bacilli.* B. SNYENAGA. *Am. Rev. Tuberc.*, 1919, 3, 473–475.

Transfers were made every two days for 334 generations. These rapid transfers did not notably affect the acid fastness of the tubercle bacillus. The reaction of culture, varying

between 1.5 per cent acidity to 2 per cent alkalinity to phenolphthalein (presumably + 1.5 to - 2.0) had no effect on acid fastness. Cultures grown on non-nutrient medium (2 gms. of agar in 100 cc. distilled water) and on Wherry's medium very soon lost their acid fast properties but after 50 to 60 transfers partially regained them.—T. G. H.

68. *The Pathogenicity of Bacterium melitensis for Guinea Pigs.* K. F. MEYER, E. C. FLEISCHNER AND E. B. SHAW. Proc. Soc. Exper. Biol. & Med., N. Y., 1919, 16, 152-156.

The authors confirm the work of Evans by demonstrating the close relationship existing between *B. abortus* (Bang) and *B. melitensis*, by furnishing two additional characteristics of similarity. Striking cutaneous hypersensitive reactions occur in guinea pigs infected with *B. abortus* when given melitensis protein, and those successfully infected with *B. melitensis* show the same skin reactions with aborto-protein. By intratesticular injections of  $\frac{1}{10}$  agar slant (48 hours' growth on peptic digest agar) of *B. melitensis*, a disease was produced giving pathological changes which could not be distinguished from those seen in guinea pigs suffering from abortion disease. Cross agglutination and absorption tests were the means of definitely diagnosing *B. melitensis* infection with the recovered organism.—L. W. F.

69. *Untersuchungen über die Variabilität der Bakterien. VII. Mitteilung ueber die Variabilität des Schleimbildungsvermögens und der Gramfestigkeit. (Studies on the Variability of Bacteria. VII. Contribution. On the Variability of Slime Formation and Reaction to Gram's Stain.)* PHILIPP EISENBERG. Centralbl. f. Bakteriologie (etc.), Jena. I. Abt. Orig., 1919, 82, 401-405.

Potato bacilli at 37°C. and 22°C. produce a dry, wrinkled growth, but at 55°C. the colonies are slimy and dome shaped, a temperature modification. Ten such strains were cultivated through 60 transfers at 55-58°C. without the character of the growth changing when again grown at 37° or 22°C. Some developed a dry growth at 55°C.

The Gram-positive character of the anthrax bacillus was not modified by 70 transfers at 42-48°C. Three strains of staphylococci yielded similar results. The 10 strains of potato bacilli noted above also retained their Gram-positive character.—R. E. B.

70. *Bacterium (Proteus) anindologenes bei gesunden und kranken Säuglingen. (Bacterium (Proteus) anindologenes in Healthy and Diseased Infants.)* J. J. VAN LOGHEM. Centralbl. f. Bakteriologie (etc.), Jena. I. Abt. Orig., 1919, 82, 449-454.

*Proteus* bacilli are of at least two distinct species, *Bact. vulgare* and *Bact. anindologenes*. The latter is somewhat less saprophytic than the former. *Proteus* bacilli are occasionally present in the stools of breast fed infants (3.6 per cent), commonly in bottle fed infants whether in health or diseased. The organisms were isolated either "directly" by placing a loopful of material in the condensation water of an agar slant, and securing the pure culture from the growth film which quickly spreads over the agar surface, or by first enriching by inoculation into broth and 24 hours later transferring to the condensation water. The latter method tends to suppress the *Bact. anindologenes* in favor of the more saprophytic *Bact. vulgare*. While the latter is present in about the same proportion in all groups of bottle fed children (20.6-23.5), the former was present in a much larger proportion (50 per cent) of those with summer diarrhea and related disorders.—R. E. B.

71. *Zur Frage der Kapselbildung des Diplobacillus Morax-Azenfeld. (The Question of Capsule Formation by Diplobacillus Morax-Azenfeld.)* NICOLAUS V. NESLINGER. Centralbl. f. Bakteriologie (etc.), Jena. I. Abt. Orig., 1918, 82, 529-531.

Proper staining methods (Buerger, Gins, Weidenreich, Kayser-Hamm though not Johnes) demonstrate capsules uniformly present on *Diplobacillus Morax-Azenfeld* both in conjunctival secretions and in pure culture from agar and from Loeffler's serum. The presence of sugar does not alter this characteristic. The capsules are relatively thin.—R. E. B.

## BACTERIAL NUTRITION AND METABOLISM

72. *Streptolysin Production in Carbohydrate Media.* F. A. STEVENS AND S. A. KOSER. J. Exper. M., Balt., 1919, 30, 539-554.

The relationship of carbohydrate fermentation, acid production and growth to hemolysin production by hemolytic streptococci was carefully studied by the authors. Five strains from acute empyema cases were chosen which gave a beta type of hemolysis, fermented dextrose, maltose, saccharose, lactose and salicin, but not mannite, inulin, glycerol or raffinose. Two per cent peptone-serum-broth cultures with and without sugars were tested at regular intervals for growth by plate counts of colonies, for acid production by determining the hydrogen-ion concentration using the Sorensen phosphate mixtures, and for lysin production by incubating increasing amounts of the supernatant fluid from the centrifuged cultures with 1 cc. of washed human red cells for 1 hour at 37°C. and then counting the undissolved cells in a Levy chamber.

It was found that the fermentable sugars, dextrose, maltose and saccharose constantly inhibited hemolysis after 24-48 hours, lactose and saccharin less constantly and the non-fermentable sugars not at all. In the dextrose media the growth of the organisms during the first 24 hours was much more rapid than in the plain broth, with at the same time a rapid

change in the hydrogen-ion concentration (e.g., from pH 7.8 up to 5.0) in the first few hours and a marked retardation of hemolysin production. The partial neutralization of the acid by the addition of 1 per cent calcium carbonate to the dextrose broth failed to prevent inhibition of hemolysis. This was interpreted to indicate that with the increased utilization of the dextrose the hemolysin production was inhibited because of protein-sparing action of the carbohydrates.

When the hydrogen-ion concentration of the media was increased before inoculation by the addition of lactic acid, growth and hemolysin production were proportional to the pH. The effect in this case was due primarily to growth inhibition. Furthermore, the incubation of sterile hemolytic filtrates in various strengths of acid showed a loss in their hemolytic property, due apparently to a certain amount of destruction of the hemolysin, since subsequent titration with either sodium hydroxide or secondary sodium phosphate back to the original pH value still showed a diminution of their hemolytic titer. Also if the concentration of acid reaches a pH of 6 or 5, some hemolysis is produced and a brown discoloration of the hemoglobin occurs.

Therefore, the principal factor in the inhibition of hemolysin production by the carbohydrates studied appeared to be a change in the metabolism of the streptococci whereby more carbohydrate and less protein was utilized, so that although growth was much increased, proportionately less hemolysin was produced. Furthermore, the acid produced lowered the vitality of the organisms, thereby diminishing proteolysis, and was actually destructive to the hemolysin.

A brief summary of the recent literature accompanies this paper.—W. P. B.

73. *The Optimum H-ion Concentration for the Growth of B. typhosus and the Effect of Changes in H-ion Concentration on the Generation Time.* P. SCHOENHOLZ AND K. F. MEYER. *Proc. Soc. Exper. Biol. & Med.*, N. Y., 1919, 16, 151-152.

The authors found that the growth range for *B. typhosus* was pH 5.0 — pH 8.6; the optimum growth was at pH 6.8 — pH 7.0. Recently isolated cultures show much more pronounced plateau and extend over a wider range than stock cultures; the stock cultures have a more decided optimum. Hydrogen-ion concentration influences the growth curve. At incubation temperatures of 36.0°-37.0°C., the minimum generation time is 31 minutes at pH 7.0, the average maximum growth begins after 5 hours; at pH 7.8 the minimum generation time is 33.4 minutes and the maximum rate of growth is reached by 8 or 9 hours, and at a pH 5.4 the minimum generation time is 41.3 minutes and the maximum rate of growth is reached after 9½ hours.—L. W. F.

74. *The Cultivation of Recently Isolated and Laboratory Strains of Human Tubercle Bacilli on Artificial Media.* H. J. CORPER. *Am. Rev. Tuberc.*, 1919, 3, 461-472.

The author used 16 different media, the bases of all of which was a medium consisting of agar 3 per cent, ammonium phosphate 0.3 per cent, sea salt 0.5 per cent, and glycerin 5 per cent. To this were added various ingredients, such as beef extract, peptone, blood, milk, casein, egg, yeast extract, rabbit's testes and rabbit's brain. Cultures of human tubercle bacilli artificially cultivated for a year or more grew equally well on almost all the media, while those strains recently isolated grew sparsely or not at all. Those media containing egg and rabbit's blood gave the best results.—T. G. H.

75. *Behavior of Bacteria Toward Arsenic.* H. H. GREEN AND N. H. KESTELL. *S. African J. Sci.*, 1919, 15, 369-374.

"Differences in the toleration of different bacteria for As are very marked. Many which are fairly tolerant of arsenate are relatively sensitive to arsenite. Certain groups are characteristically sensitive, e.g., the subtilis group, of which the four leading representatives were tested, and all found intolerant of 0.05 per cent of  $As_2O_3$ , as sodium arsenite in broth. Other groups, notably the putidum family, can tolerate from 10 to 20 times this concentration, some members growing freely in 1 per cent arsenite broth. The colon-typhoid group is sensitive as a family, but has at least one outstanding exception in *B. arsenreducens*, and other resistant members probably exist. Resistance to arsenic is therefore not a rigorous group characteristic, although it is probably as characteristic as any other biochemical feature, and might find a place in diagnostic bacteriology. Apart from the members of the putidum group five highly resistant bacteria (i.e., non-sporulating rod forms) are described but not named. Of four cocci tested three were found sensitive, and one tolerant. Two members of the Streptothrix group were both sensitive. Yeasts and molds generally show a high degree of tolerance. Although over a dozen arsenic-resistant species of bacteria were examined, only two showed any chemical activity toward arsenic; the earlier described *B. arsenoxydans*, which oxidizes arsenite to arsenate, and *B. arsenreducens*, which reduced arsenate to arsenite. The others were merely tolerant. . . ." (Chem. Abstr.)—G. H. S.

76. *De la culture du bacille tétanique en présence de la tuberculine. Procédé de dosage de la tuberculine.* (The Culture of *B. tetani* in the Presence of Tuberculin. The Measurement of Tuberculin.) F. MARINO. *Compt. rend. Soc. de biol., Par.*, 1919, 82, 821.

If culture of *B. tetani* is added to a series of tubes containing suitable media together with graduated quantities of tuberculin filtrates (from 1 to 10 mgm. to each tube with 10 cc.

of the medium) growth of the tetanus bacillus will occur in the first 5 or 6 tubes, will be delayed in the 7th and 8th, will be inhibited almost invariably in the 9th, and will always be lacking in the 10th. Thus, *B. tetani* will fail to grow in media containing 1 mgm. of tuberculin per cc., and this method of titration is suggested for measuring the tuberculin content of culture filtrates.—G. H. S.

77. *De la culture du Bacille tétanique en présence de la tuberculine. Détermination du pouvoir antitoxique des sérums antituberculeux. (Culture of B. tetani in the Presence of Tuberculin. Determination of the Antitoxic Potency of Antituberculous Sera.)* F. MARINO. Compt. rend. Soc. de biol., Par., 1919, 82, 823.

Antituberculous serum, i.e., serum from animals repeatedly injected with tuberculin, will neutralize the tuberculin to such an extent that *B. tetani* will grow in media containing dilutions of tuberculin. The neutralizing action of the antituberculous serum is, however, no greater than that of normal serum.—G. H. S.

78. *De la culture of B. tétanique en présence de la tuberculine. (The Cultivation of B. tetani in the Presence of Tuberculin.)* F. MARINO. Compt. rend. Soc. de biol., Par., 1919, 82, 831.

Cultures of human and bovine strains of *B. tuberculosis* killed guinea pigs within 2 to 3 months, the equine strain resulted in death only after 5 to 6 months. Thus a difference in virulence was apparent. The ability of the different strains to produce tuberculin was tested by inoculating filtrates of the cultures with *B. tetani*. The filtrates from the human and bovine strains inhibited the development of the tetanus bacillus after the tubercle bacillus had been grown for 30 to 35 days, filtrates of the equine strain did not inhibit until after growth had continued for 50 days. This indicates that the power to produce tuberculin and the virulence are related. Also, the human, bovine, and equine races are clearly different. Individual strains within a single race also differ.—G. H. S.

79. *B. coli comme indicateur de la protéolyse. (B. coli as an Indicator of Proteolysis.)* E. WOLLMANN. Compt. rend. Soc. de biol., Par., 1919, 82, 1263.

*B. coli* grown in media such as horse serum, egg white, etc., does not produce indol. If the media has been previously employed for the culture of a proteolytic organism the growth of *B. coli* is accompanied by indol production.—G. H. S.

80. *Action diverse des microbes sur la coagulation du sang. (The Action of Different Bacteria on the Coagulation of Blood.)* ANDRÉ GRATIA. Compt. rend. Soc. de biol., Par., 1919, 82, 1245.

A study of the coagulation of oxalated plasma by staphylococci. In such a mixture the stability of the fibrogen is progressively diminished, coagulation is favored and finally it becomes complete. As fast as the fibrogen is flocculated and coagulated the remainder of the fluid becomes incoagulable. *Streptococcus hemolyticus* has an opposite effect. The mixture contains sufficient fibrinogen but the organism elaborates large quantities of antagonistic substances which effectively prevent coagulation.—G. H. S.

81. *À propos de la coagulation du plasma oxalaté par le staphylocoque. (Transformation du prosérozyme en sérozyme.) (Regarding the Coagulation of Oxalated Plasma by Staphylococci. Transformation of Proserozyne into Serozyme.)* ANDRÉ GRATIA. Compt. rend. Soc. de biol., Par., 1919, 82, 1247.

An interpretation of the processes of coagulation as brought about in mixtures of plasma and staphylococci.—G. H. S.

82. *Sur la valeur de la réaction de l'indol. (The Value of the Indol Reaction.)* CH. NICOLLE, G. BLANC AND L. CAILLON. Compt. rend. Soc. de biol., Par., 1919, 82, 1126.

A number of strains of *Coccobacillus acridiorum*, probable all of the same origin, were proven identical in their serological relationships, yet in the production of indol in peptone water marked variation was shown.—G. H. S.

83. *Fermentation butyléneglycolique des sucres par la bactérie charbonneuse. (Butyleneglycol Fermentation of Sugars by B. anthracis.)* LEMOIGNE. Compt. rend. Soc. de biol., Par., 1919, 82, 984.

*B. anthracis* breaks down sugars by a process analogous to that followed by *B. subtilis*. The results differ in that *B. anthracis* fermentation yields acetic acid as well.—G. H. S.

84. *Sugared Tinctures of Litmus Used in Bacteriology.* V. ZOTIER. J. Pharm. chim., 1919, 20, 115-118.

From experiments with litmus solutions to which were added sugars, as dextrose, lactose, maltose, sucrose, and in which such organisms as *B. dysenteriae*, Shiga and Flexner, and *B. paratyphosus* B were grown, it is shown that the color reactions are the same quite regardless of whether or not sterilization occurs before or after mixing the solutions. It is recommended that the litmus sugar solutions be sterilized for 20 minutes at 110° or 120°C. (Chem. Abstr.)—G. H. S.

85. *Milieu de cultures au poisson. (Culture Media Prepared from Fish.)* E. HARDE AND A. HAUSER. *Compt. rend. Soc. de biol., Par.*, 1919, 82, 1259.

Two media were prepared from the flesh of the whiting: (1) The flesh is cut into cubic centimeter pieces, one such piece is placed in each tube, 8 cc. of distilled water is added, and the medium sterilized at 120° for 20 minutes.

(2) Flesh of the whiting, 500 grams; water, 1000 cc. Boil for 30 minutes. Filter through paper and sterilize for 20 minutes at 120°. Render neutral to litmus. Use for the preparation of gelatin or agar as a meat bouillon is employed. No peptone or salt is used.

The following organisms have been cultivated on this medium. *Gonococcus*, *meningococcus*, *streptococcus*, *pneumococcus*, *staphylococcus*, *B. diphtheriae*, *B. typhosus*, *B. coli*, *B. dysenteriae*, *B. pyocyaneus*, *B. anthracis*, *B. tetani*, and *B. perfringens*. The vitality of the cultures on such media is well-preserved (*gonococcus* 3 weeks).—G. H. S.

86. *Les milieux à la chair de poisson pour la production de la toxine tétanique. (Fish Flesh Media for the Production of Tetanus Toxin.)* E. HARDE AND A. HAUSER. *Compt. rend. Soc. de biol., Par.*, 1919, 82, 1304.

*B. tetani* was cultivated in the media previously described. The toxin produced was not as highly potent as that developed in meat-peptone-bouillon.—G. H. S.

87. *Untersuchungen zur Atmung getöiteter Zellen. II. Mitteilung. Der Oxydationsvorgang in getöiteter Hefe und Hefeeextrakt. (Studies on the Respiration of Killed Cells. II. Contribution. The Progress of Oxidation in Killed Yeast Cells and Yeast Extract.)* OTTO MEYERHOF. *Arch. f. d. ges. Physiol.*, 1918, 170, 367-427.

The oxygen consumption (in respiration) of unwashed acetone yeasts varies within wide limits. It decreases markedly with the age of the preparation. It is dependent upon the hydrogen ion concentration, the optimum lying at neutrality (pH = 7.0). Dilution decreases relatively the rapidity of respiration. It is increased in pure oxygen. The percentage increase of respiration through the presence of methylene blue increases on the acid side, and is dependent upon many influences in the medium. Narcotics tend to inhibit respiration, but HCN does not.

Respiration of the acetone yeast is markedly decreased by washing, but is restored by the addition of the water extract. The degree of restored respiration is proportional to the concentration of the water soluble substance or mixture, termed the "respiration body." Extracted yeast is thermolabile, but the "respiration body" may be boiled, although long heating will finally inactivate. It is precipitated by 85 per cent alcohol. It is retained on the ultra filter. The extract takes up some oxygen especially in alkaline solution, and the "respiration body" is partially destroyed.

Yeast maceration extract (Lebedew) shows marked respiration agreeing in general characteristics with acetone yeast, except for the influence of concentration. The respiration system can be precipitated quantitatively by 85 to 90 per cent alcohol. By washing with alcohol-ether and drying in a vacuum one may secure a permanent "respiration powder." It goes completely into solution in water; the insoluble residue is inactive. In the aqueous extract the carbon dioxide corresponds to from a quarter to a half of the oxygen consumption.

By use of the ultra filter the respiration may be increased, though considerable washing on the ultrafilter leads to complete inactivity. It is reactivated by the addition of ultrafiltrate. The portion not passing the filter corresponds to the extracted acetone yeast, and the filtrate to the acetone yeast extract.—R. E. B.

88. *Untersuchungen zur Atmung getöiteter Zellen. III. Mitteilung. Die Atmungsregung in gewaschener Acetonhefe und dem Ultrafiltrations-rückstand von Hefemacerationsasse. (Studies on Respiration of Dead Cells. III. Contribution. Respiration in Washed Acetone Yeast Cells and the Ultrafiltration Residue of Yeast Maceration Extract.)* OTTO MEYERHOF. *Arch. f. d. ges. Physiol.*, 1918, 170, 428-475.

Most substances do not restore the capacity for respiration to washed acetone yeast or the washed ultra-filter residue of the yeast maceration extract (aldehydes, proteins, organic acids, cystein, etc.). Typical respiration is evoked by hexose phosphate (less vigorous than by the "respiration body"); and a characteristic oxidation in washed acetone yeast with thioglycolic acid and  $\alpha$  thio-lactic acid.

The extracts containing the respiration body give the reaction of the sulfhydryl group.

There is in general a parallelism between the strength of the SH reaction in the acetone yeast extract and the degree of respiration which it will induce. This is true also for the ultra filtrate and the boiled extract resulting from maceration, and for the watery extract termed "respiration powder." Nevertheless there are occasional divergences from the rule.

The SH reaction of acetone yeast extract corresponds to about  $\frac{m}{888}$ . For the development of the disulphid only about 4 cc. of oxygen are necessary to 2 cc. of the solution, although the acetone yeast in a few hours may take up a hundred times this amount without causing the SH reaction completely to disappear. It is evident that the sulfhydryl group must act in this extract only as the carrier of oxygen without simultaneous disulphid formation. A similar transfer of oxygen can be shown in thioglycolic acid and  $\alpha$  thio-lactic acid on washed acetone yeast in neutral and weaker acid solutions. In six hours these will take up about five times the amount of oxygen that is necessary for disulphid formation without the SH group being completely oxidized.

In neutral or weakly acid reactions the aqueous solution of thioglycolic and  $\alpha$  thiolactic acid are completely stable in the air even in the presence of  $MnCl_2$ . For spontaneous oxidation and the catalytic destruction by means of a metallic salt at least a slight alkaline reaction is necessary. The oxygen transfer is therefore impossible in alkaline solutions, because of the presence of the acetone yeasts the SH group is quantitatively changed into disulphid, that is there is an oxidative destruction of the oxygen carriers. This corresponds to the "alkali incubation of the extract" and to the respiration in alkaline solutions.

In spite of many similarities the oxygen transfer through the acids named is not exactly the action of extracts, for the former it is necessary that the SH concentration be at least ten times as great as for the latter. The transfer of oxygen to boiled or heated acetone yeast will also occur, the transfer is not inhibited by narcotics, and is not increased by the presence of methylene blue.

A study was also made of the relationship of these acids to various proteins, likewise the effect of sodium hexose phosphate on respiration.—R. E. B.

89. *Carbon Dioxide Production in Small Organisms.* E. J. LUND. Biol. Bull., Bost., 1919, 36, 105-114.

A method is described for measuring, with only a small error, the  $CO_2$  given off by protozoa, eggs, bacteria, etc. (Physiol. Abstr.)—G. H. S.

90. *Zur Chemie der Amöben. (On the Chemistry of the Ameba.)* P. G. UNNA AND ELEONORE TH. TIELEMANN. Centralbl. f. Bakteriol. (etc.), Jena. I. Abt. Orig., 1917, 80, 66-89.

Amebae from hay infusion were fixed upon a glass slide by means of the vapor of osmic acid. By treatment with various stains and preliminary treatment with various solvents, it is possible to determine something as to the chemical nature of the various parts of the ameba cell. These cell constituents are divided primarily into the basic proteins, the acid proteins, and the lipoids. Under the first heading, the basic proteins most difficultly soluble are stained with hematoxylin and are dissolved by a 1 per cent trypsin solution. They are present in the inner nucleus, the outer nucleus, endoplasm, and ectoplasm. The more easily soluble basic proteins were stained also with hematoxylin. Those soluble in distilled water are present only in the endoplasm in the so-called "wabeninhalte." Those soluble in 2 per cent NaCl are present only in the "wabenumgebung." The protamins are stained red with Giemsa stain and are not soluble KOH or in pepsin. They are prominent only in the outer layer of the nucleus.

Among the acid proteins the globulin is stained by polychrome methylene blue. It is soluble in 2 per cent NaCl, and is present in the inner nucleus, and in the "wabenumgebung" of the endoplasm and the ectoplasm. The albumoses, soluble in distilled water, are present in the "wabeninhalte" of both the endoplasm and the ectoplasm.

Lipoids such as fatty acids, glycerinated fats, cholesterinesters, and lecithin, stained with polychrome methylene blue, are soluble in acetone, alcohol, and benzene, and are present both in "wabenumgebung" and "wabeninhalte" of both endoplasm and ectoplasm. A colored plate illustrates the color reactions.

It is impossible in the ameba to secure any nuclear staining by means of methyl green. This fact indicates the absence of nucleic acid and nuclein from the ameba. There is a detailed discussion of the physiological bearing of these facts.—R. E. B.

91. *Bile et Bactérie charbonneuse. (Bile and Anthrax Bacteria.)* L. PANISSET. Compt. rend. Soc. de biol., Par., 1919, 82, 1318.

Beef bile allows the organism to grow and seems to have no effect on the virulence, morphology, or staining characteristics. In fact, the bile of guinea pigs dead of anthrax infection is virulent since it contains fully pathogenic organisms—G. H. S.

## PHYSICAL CHEMISTRY

92. *Hydrogen Ion Concentration of Cultures of Pneumococci of the Different Types in Carbohydrate Media.* O. T. AVERY AND GLENN E. CULLEN. J. Exper. M., Balt., 1919, 30, 359-378.

Thirty-nine strains of pneumococci, comprising representatives of the various immunological types, were included in this study. The colorimetric method of determining hydrogen ion concentration was employed with Walpole's comparator method of superimposing the color of the medium upon that of the indicator. The sugars were sterilized by boiling concentrated solutions in water for ten minutes and then adding them to sterile tubes of plain broth in any desired quantity.

The optimum initial hydrogen ion concentration for the growth of pneumococci was found to be pH 7.8. In broth cultures growth continued until a final pH of about 5.0 was reached if sufficient fermentable carbohydrate (above 0.4 per cent) was present. Apparently this degree of acidity was sufficient in itself to stop growth. If less carbohydrate was present, growth ceased at a lower hydrogen ion concentration, apparently because of exhaustion of carbohydrate. If no carbohydrate was present except that derived from the meat from which the broth was made, growth initiated at pH 7.8 ceased at pH 7.0.

If bacteria-free filtrates of plain broth cultures in which growth had ceased were readjusted to pH 7.8 and reinoculated with pneumococci, no growth occurred unless carbohydrate was added, but growth did occur in bacteria-free filtrates of dextrose broth cultures in which growth had ceased (pH 5) and which had been readjusted to pH 7.8. No change in the reaction of the dextrose broth medium was observed during the period of initial lag.

Cultures of pneumococcus with all the carbohydrates which were fermentable under the conditions used, namely, maltose, saccharose, lactose, galactose, raffinose, dextrose and inulin, gave identical results in the rate of reaction change and final pH attained. The final hydrogen ion concentration was found to be about pH 5.0, this result not being affected by concentrations of fermentable sugar beyond 0.4 per cent. The rate of acid production, while a function of the size of the inoculum and of the optimum reaction of the medium, was, as previously shown by Chesney, and Cullen and Chesney, after the period of initial lag, rapid and constant until the final pH was reached.

The different immunological types of pneumococcus, for the limited number of strains studied, behaved alike in fermenting the carbohydrates mentioned above.—I. W. P.

**93. *The Relation of the Pneumococcus to Hydrogen Ion Concentration, Acid Death-Point and Dissolution of the Organism.* FREDERICK T. LORD AND ROBERT N. NYE. J. Exper. M., Balt., 1919, 30, 389-399.**

Experiments were carried out to determine the importance of the hydrogen ion concentration in causing pneumococci to die out in broth. Flasks inoculated with pneumococci and incubated until all organisms were dead showed a pH of about 5.15. When such broth was restored to a pH of about 7.65 by the addition of sodium hydroxide and reinoculated with pneumococci, growth occurred again, suggesting that death was primarily due to a too high pH. Such reinoculations could be performed repeatedly, following neutralization after the organisms had died, the period of viability increasing with each new reinoculation, due possibly to partial exhaustion of the material from which the acid is formed.

When pneumococci were washed and suspended in normal saline and added to solutions of different hydrogen ion concentration, it was found that they were killed in 54 hours in hydrogen ion concentration of 5.6 to 4.0, and that there was some inhibition from 5.6 to 6.8 beyond which present other growth occurred. The fixed types vary in their susceptibility to hydrogen ion concentration, Type I being the most susceptible and Type III the least, though experiments indicate that these differences are not constant. In general, in fresh media, the pneumococcus withstands a pH of about 5.3 for 1 hour, of 5.6 for 3 hours and of 6.1 for 6 hours. When reinoculated into a medium in which pneumococci have grown and died out it withstands a pH of about 5.1 for 1 hour, indicating further that acidity is the most important factor in causing death. The greater the hydrogen ion concentration, the more rapid the death. Pneumococci will live in a suitable culture medium at a pH of about 6.8 to 7.4 for at least many days (possibly months).

Suspensions of washed pneumococci in solutions of varying hydrogen ion concentrations, when incubated, show clearing of the tubes in about the range pH 5.0 to pH 6.0, the tubes on the more acid side of the scale remaining cloudy. Smears from the acid tubes show pneumococci of good morphology but Gram-negative, which those from the cleared tubes (pH 5.0-6.0) show a few poorly stained organisms with shadowy remains of others, the pneumococci being disintegrated. Disintegration is clearly not due to acidity alone. It may be caused by an enzyme derived from the bacteria themselves.—I. W. P.

**94. *The Nature of Osmotic Pressure.* M. KOSAKAI. Proc. Soc. Exper. Biol. & Med., N. Y., 1919, 16, 118-119.**

As with boric acid, the hemolytic effect of both formaldehyde and urea is the result of osmotic pressure. The author made comparative quantitative studies of the hemolytic action of the three substances. The results of the work brought out certain facts of importance, which leads the author to the view "that osmotic pressure is merely the pressure of the water which diffuses through a semipermeable membrane to the side of higher 'osmotic concentration,' if, as is necessary, the factor of time, is taken into consideration," and not "that osmotic pressure is exerted directly by the solute." The degree of osmotic pressure developed depends not only upon the original concentration of the diffusible solute, but also upon the rate of diffusion of the substance. The different diffusion rates of the three substances studied correspond with the differences in their hemolytic action, thus confirming the view "that osmotic pressure is not a direct property of a solute but merely water pressure developed by the process of diffusion."—L. W. F.

**95. *Blood Viscosity. I. Conditions Affecting the Viscosity of Blood after Withdrawal from the Body.* L. LANGSTROTH. J. Exper. M., Balt., 1919, 30, 597.**

The method used was to withdraw blood from an arm vein into a Record syringe previously wet with a saturated solution of potassium oxalate, immediately fill a Determann viscosimeter, maintained constantly at 20°C., and then measure outflow time with a stopwatch. It was first found that small quantities of potassium oxalate did not alter the viscosity at all, even using varying amounts from 0.2 to 0.6 grams per 5 cc. of blood. Wide variations in readings occurred when the blood was incompletely mixed, or when insufficient quantities of blood were used, 5 cc. being the minimal amount for accurate results. Rapid



increase in the viscosity resulted when the blood was allowed to stand in contact with the air, due to loss in carbon dioxide content; but could be prevented by stoppering the container and agitating until the blood came into  $\text{CO}_2$  equilibrium with the air above it. There was likewise rapid increase in viscosity with lowering of the temperature below  $38^\circ\text{C}$ .—W. P. B.

96. *Blood Viscosity. II. Effect of Increased Venous Pressure.* L. LANGSTROTH. J. Exper. M., Balt., 1919, 30, 607.

The effect of increase in venous pressure was studied by comparison between the blood before and at repeated intervals after the application of a binder loosely to the arm. The viscosity, as determined by a Determann viscosimeter, increased markedly with increase in pressure even for but 2 minutes as did also the hemoglobin, as determined both by the carbon monoxide method and the gasometric method. Analysis of the total plasma  $\text{CO}_2$  and, after saturation with alveolar air, the plasma bicarbonate were made, but the value of neither followed consistently the viscosity, the increase of which therefore could not be attributed to changes in the carbon dioxide content of the blood. The oxygen unsaturation values and the venous oxygen varied widely, but there was an increase in the oxygen-carrying power commensurate with the decrease in viscosity due apparently to a concentration of the blood in the capillaries through loss of blood into the tissues and resultant increase in the relative amount of hemoglobin and the relative volume of red blood cells as demonstrated. Likewise the total nitrogen in the blood plasma and the viscosity of the plasma increased, indicating a concentration of the plasma as well as of the red blood cells, so that the increase in viscosity could be attributed to a relative increase in red blood cells and the concentration of the plasma, and not to any changes in carbon dioxide or oxygen content.—W. P. B.

97. *Les caractères physico-chimiques du sérum au point de vue de la réaction de Bordet-Wassermann.* (The Physico-chemical Characteristics of Serum from the Point of View of the Wassermann Reaction.) W. KOPACZEWSKI. Compt. rend. Soc. de biol., Par., 1919, 82, 1269. The results of examination of 57 specimens of serum are given:

Serum	D	$\sigma$	$\eta$	Cat $10^{-4}$
	1.029	69.32		
Positive { Male.....	(1.0270-1.0286)	(67.55-72.31)	2.10	112.0
Female.....	1.0264	69.51	2.04	109.0
	(1.0248-1.0281)	(67.05-75.99)		
	1.0276	67.81		
Negative { Male.....	(1.0249-1.0286)	(66.35-69.70)	2.14	111.3
Female.....	1.0274	67.60	2.11	108.0
	(1.0235-1.0286)	(63.80-70.42)		

Where D = density;  $\sigma$  = surface tension; and  $\eta$  = viscosity.  
Cat  $10^{-4}$  = specific conductivity.

A positive Wassermann reaction thus accompanies an increase in surface tension and a decrease in viscosity.—G. H. S.

## BACTERIOLOGICAL TECHNIC

98. *Adjustment of Reaction of Culture Mediums.* E. A. FENNELL AND M. B. FISHER. J. Infect. Dis., Chicago, 1919, 25, 444-451.

A report on the false results of phenolphthalein titrations as contrasted with the accuracy of the determination of hydrogen-ion concentration as the index of the true reaction of a culture medium. The authors review previous work on the subject, especially that of Clark and Lubs, and describe in detail the practical method of applying the colorimetric system of H-ion determinations to the titration of media in the ordinary laboratory of bacteriology.

Definite directions for the steps in the procedure are given in detail, with the purpose of popularizing the method. Tables of the standard salt solutions are given, together with a table showing the optimum and limiting values of pH for a number of common pathogenic organisms.

The authors conclude that "the adjustment of bacteriologic culture mediums according to the hydrogen-ion concentration, because of its accuracy and simplicity, should wholly supplant the phenolphthalein (total acidity) method."—S. B-J.

99. *A Method of Standardizing Bacterial Suspensions.* F. L. GATES. J. Exper. M., Balt., 1920, 31, 105.

The opacity of a bacterial suspension in a test tube is determined by measuring the depth at which a nichrome wire loop pushed gradually down into the suspension, disappears from view when looking down into the tube through its mouth. By comparison with standard solu-

tions of the same organism the measured opacity may be calculated in terms of the number of bacteria per cubic centimeter. An instrument devised for this purpose is described in detail.—W. P. B.

100. *On Methods of Isolation and Identification of the Members of the Colon-Typhoid Group of Bacteria. Further Studies on C. R. Indicator.* J. BRONFENBRENNER, D. SOLETSKY AND M. J. SCHLESINGER. *Proc. Soc. Exper. Biol. & Med.*, N. Y., 1919, 17, 25-28.

Bronfenbrenner previously reported "an indicator for the direct measurement of the hydrogen ion concentration in growing bacterial cultures." A mixture of china blue and rosolic acid constitutes the indicator. It covers a range of changes in the hydrogen ion concentration between  $C_M \approx 1 \times 10^{-9}$  and  $C_M \approx 5 \times 10^{-5}$ . The dyes possess a high tinctorial power, so must be incorporated with the media in very minute quantities, for china blue 0.0025 per cent and rosolic acid 0.005 per cent by weight. Since rosolic acid exerts selective bactericidal action against Gram-positive organisms, the use of the indicator is limited to the study of the Gram-negative group. In order to overcome this objection, the authors found that the substitution of corallin (Harmer) for the rosolic acid (Merck) gave satisfactory results, as in other respects the corallin gave similar reactions as the rosolic acid, while being applicable to both Gram-negative and Gram-positive organisms.—L. W. F.

101. *A new Method for Procuring Blood for Wassermann Tests.* R. G. OWEN AND F. A. MARTIN. *J. Am. M. Ass.*, Chicago, 1920, 74, 98.

A new instrument for drawing blood for Wassermann tests is described.—P. G. H.

102. *Méthode de coloration des Cils Microbiens—modification des Procédés de Zettnow et de Van Ermenghen. (A Staining Method for Bacterial Flagella—A Modification of the Zettnow and Van Ermenghen Methods.)* EDGAR LANCEREUX. *Presse méd.*, Par., 1919, 27, 565.

Use clean, alcohol-washed slides. Dilute the culture (24 hours) in distilled water, and place a drop on the slide, drying at room temperature or 37°C. Heat with the mordant solution to 60°C. over the flame and let cool 10 minutes. Wash with tap and distilled water. Mordant:

Antimony chloride.....	1 gram	} Forms precipitate of antimony oxy- chloride
Tannin.....	5 "	
Formol.....	10 cc.	
Dist. water.....	100 "	

Heat the slide with Fontana's ammoniacal silver nitrate until a metallic precipitate is formed. Wash well in tap and distilled water. Fontana:

AgNO <sub>3</sub> .....	1 gram	} Add ammonia drop by drop until the precipitate which forms is dissolved to a slight opalescence. The solu- tion must not be completely cleared. Keep in yellow glass; use fresh.
Distilled water....	20 cc.	

Reduce the slide for one minute. (Any good photographic developing chemical will do.) An effective one consists of 20 per cent metal in distilled H<sub>2</sub>O with 25 per cent sodium sulphite added to stabilize.

By this method, the cilia show brown, sometimes enlarged. Failures with the method are attributable to poor silvering; the solution should be checked on spirochetal bodies (mouth organisms, etc.).—L. A. K.

103. *Una nuova e semplice forma per la colorazione del Romanowsky. (A New and Simple Form of Romanowsky's Stain.)* R. ROMANESE. *Policlin.*, Roma, 1919, 26, 873.

The following stain, while not the equal of Giemsa for fine scientific research, has proved to be just as practical for the examination of malarial parasites and leucocytes: Dissolve 0.75 grams methylene blue in 50 cc. of 95 per cent ethyl alcohol and 50 cc. glycerin. Add 3 cc. of a 10 per cent solution of sodium carbonate and boil for 15 minutes. Add 35 cc. of a 1 per cent solution of casein in 95 per cent alcohol and boil again for 15 minutes. Cool, bring up to 100 cc. with 95 per cent alcohol and allow to remain in a closed vessel for at least a week before using. When kept well stoppered, it remains unchanged for months.

With one or two exceptions, the staining is done similar to Giemsa: (1) fix 5 minutes with methyl alcohol; (2) pour off excess alcohol and without washing pour upon the slide 2 drops of the stain for every drop of distilled water. Stain for 20-25 minutes; (3) wash briefly with distilled water; (4) dry with blotting paper, and examine in cedar oil.—P. M.

104. *Zur Färbetechnik der Malaria-Parasiten. (On Staining Technic of Malarial Parasite.)* LEO APPEL. *Centralbl. f. Bakteriol. (etc.)*, Jena. I. Abt. Orig., 1917, 80, 105-107.

A centrifuge is figured which will hold 8 microscope slides for quick drying. When covered by a case it may be used for removal of stains from the mounts.

The blood smears are fixed in methyl alcohol 1-5 minutes, dried in the air or centrifuged. They are then stained for 15 to 20 minutes in a solution consisting of distilled water 100 cc., aqueous methylene blue solution Koch's 1.5 cc., alcoholic 1 per cent fuchsin solution 0.28 cc.

The stain is removed by centrifugation and the mount dried, or it is placed in 5 per cent urotropin solution in order to fix the stain, washed in water and dried. The erythrocyte and plasma of the leucocyte are rose colored, the nuclei of the leucocyte and of the malarial parasite dark blue. It is claimed that in some respects the contrast of staining with this method is better than with the Giemsa method.—R. E. B.

105. *Plazentabouillon als billiges und zuverlässiges Nährmedium zur Gewinnung von Diphtherietoxin.* (Placenta Bouillon as a Cheap and Satisfactory Nutrient Medium for Production of Diphtheria Toxin.) FRANZ V. GRÖBER AND JOH. SRNKA. *Centralbl. f. Bakteriologie* (etc.), Jena. I. Abt. Orig., 1918, 82, 333-336.

Human placenta was substituted successfully for beef and horse flesh in the preparation of infusion broth for the manufacture of diphtheria toxin.—R. E. B.

106. *Metachromgelb als Hemmungsmittel für Kokken und Sporenbildner und seine Verwendbarkeit für Nährböden zur Typhus-Ruhrdiagnose.* (Metachrome Yellow as an Inhibitory Substance for Cocci and Spore-Formers and its Utilization in Nutrient Media for Typhoid Dysentery Diagnosis.) G. GASSNER. *Centralbl. f. Bakteriologie* (etc.), Jena. I. Abt. Orig., 1917, 80, 120-127.

A medium containing yeast water 1000 cc., peptone 10 grams, NaCl 5 grams, and agar 30 grams, was rendered slightly alkaline to litmus, and various amounts of metachrome yellow II RZ were added. A good growth of various members of the colon-typhoid series including *B. coli*, *B. typhi*, *B. paratyphi* B., dysentery Y, and dysentery Shiga-Kruse, was secured in solutions up to 0.2 per cent. None of the organisms of the spore-producing type, *Staphylococcus pyogenes*, *Streptococcus acidilactici*, or air cocci, grew in percentages as high as 0.1. It is urged that this medium is a satisfactory method of securing growth of all members of the colon-typhoid series without contamination by accompanying forms. The concentration recommended is 0.1 per cent.—R. E. B.

107. *Nouvelle méthode très simple pour cultiver facilement les microbes anaérobies. Les milieux semi-liquides en bactériologie.* (New and Simple Method for the Cultivation of Anaerobes. Semi-fluid Media in Bacteriology.) J. LIGNIERES. *Compt. rend. Soc. de biol., Par.*, 1919, 82, 1091.

The medium in question is a gelatin or agar medium (0.25 per cent), to which other substances, as sugars, serum, bile, litmus, etc., may be added. Such organisms as *B. tetani*, *B. anthracis*, *Vibrio septique*, *B. butyricus*, the bacillus of necrosis of Schmorl, *B. perforans*, *B. sporogenes*, *B. putrificus*, and *B. edematiens* grow readily.—G. H. S.

108. *Zur Technik der Anaërobenkultur mittels des Pyrogallolverfahrens.* (The Technic of Anaerobic Culture by Means of Pyrogallol.) EMIL LÖWI. *Centralbl. f. Bakteriologie* (etc.), Jena. I. Abt. Orig., 1919, 82, 493-496.

Methods of using sodium pyrogallate for anaerobic cultures in plates and test tubes are detailed. R. E. B.

109. *Experiments with A. Kühn's U-Cultures.* C. BARTHEL. *Kgl. Landbruks-Akad. Handl. Tid.*, 1919, 58, 85.

The U-cultures were subjected to thorough bacteriological tests and the organisms present were identified. From the results of field experiments with the cultures it appeared that they exerted no favorable effect. (*Physiol. Abstr.*)—G. H. S.

110. *Le chauffage électrique des études de laboratoire à faible température. Interrupteur auto-régulateur magnétique.* (Electric Heating of Low-Temperature Laboratory Incubators. A Magnetic Self-regulating Interruptor.) TH. RAYNAL. *Presse méd.*, (Suppl.), 1919, 27, 946.

The regulating device is a mercury-filled tube, in which the rising column completes the circuit between a fine Pt wire inserted above, and a termination on the height-adjusting screw; this circuit includes an electro-magnet, and current is furnished by dry or other low-potential cells. A small metal beam carrying a soft iron block at one end and a Pt wire, dipping into mercury at the other end, is balanced on uprights, one of which receives the termination of the street circuit. The bar is weighted so that the mercury-contact is closed; the street current, between mercury and source, contains a heating unit. (Carbon filament lamps are suitable.) The other end of the bar, carrying the soft-iron armature, is suspended above the electro-magnet. After first adjusting the column of mercury in the interruptor-tube, (which is placed within the incubator or bath) so that contact of the battery-circuit is made just above the desired temperature, excess warmth breaks the heating circuit by the pull on the electro-magnet, and the incubator cools below the temperature at which contact is broken.—L. A. K.

## INDUSTRIAL BACTERIOLOGY

(See also Numbers 488, 489, 490, 491)

111. *Retting of Flax by Means of Bacteria*. R. LOESER. Umschau, 1918, 22, 685-686; J. Soc. Chem. Indust., Lond., 38, 407A.

In carrying out Rossi's process of retting, flax was boiled for 40 minutes and then treated with a culture of *B. comessii* (which is closely related to the butyric acid bacteria) in large vats aerated from below. After fermentation for 36 to 40 hours at 30 to 32°C. the flax had only a slight brown color and was nearly odorless. (Chem. Abstr.)—G. H. S.

112. *Über Glycerin-Gewinnung durch Gärung*. (Glycerin Formation by Fermentation.) W. CONNSTEIN AND K. LÜDCKE. Ber. deut. chem. Ges., 1919, 52, 1385-1391.

In the ordinary fermentation of sugar the yield of glycerin is about 3 per cent, but in slightly alkaline media the yield is increased. If sodium sulfite is used in high concentrations it acts as an antiseptic and prevents the development of lactic acid bacilli. When the weight of sulfite used is 40 per cent of the weight of the sugar the yield of glycerin is 23.1 per cent; and if the sulfite is increased to 200 per cent of the weight of sugar the yield is 36.7 per cent. Further increase retards fermentation and damages the yeast. Ethyl alcohol, acetaldehyde, trimethyleneglycol are by-products of the fermentation. (Physiol. Abstr.)—G. H. S.

113. *The Production of Glycerol from Molasses*. A. R. LING. J. Soc. Chem. Ind., Rev., 1919, 38, 175-177.

By fermenting sugars (17.5 to 20 per cent) containing 5 per cent of  $\text{Na}_2\text{CO}_3$  (not added all at once) with *Saccharomyces ellipsoideus* var. Steinberg, at 30 to 32°C. about 20 to 25 per cent of the sugar is converted into glycerin, and practically all of the remainder into alcohol and  $\text{CO}_2$ . (Physiol. Abstr.)—G. H. S.

114. *Decomposition of Betaine by the Bacteria of "Guanol," a Fertilizer Prepared from Molasses Waste*. ALFRED KOCH AND ALICE OELSENER. Biochem. Ztschr., Berl., 1919, 94, 139-162.

Organisms were found which attack betaine with the formation of  $\text{Me}_3\text{N}$ ,  $\text{NH}_3$ , and  $\text{CO}_2$ .  $\text{MeOH}$ ,  $\text{HCO}_2\text{H}$  and  $\text{AcOH}$  in small amounts appear to be intermediate products in the production of  $\text{CO}_2$ . (Chem. Abstr.)—G. H. S.

115. *The Production of Acetone and Butyl Alcohol by a Bacteriological Process*. H. B. SPERMAN. J. Soc. Chem. Ind., Trans. 1919, 38, 155-161.

The essential of the method is the bacterial fermentation of a fairly concentrated mash of maize. Full technical details are given. (Physiol. Abstr.)—G. H. S.

116. *The Manufacture of Acetone*. FREDERICK NATHAN. J. Soc. Chem. Ind., 1919, 38, 271; Chem. Trade J., 1919, 65, 113.

A description of the process of making acetone by bacterial fermentation of corn, rice, horse-chestnuts, etc. (Chem. Abstr.)—G. H. S.

117. *The Acetone Fermentation Process and its Technical Applications*. AMOS GILL. J. Soc. Chem. Indust., Lond., 1919, 38, 273; Chem. Trade J., 1919, 65, 113.

The technical details of the method for the production of acetone by bacterial action. (Chem. Abstr.)—G. H. S.

118. *Alcohol from Vegetable Ivory*. G. MEZZADROLI. Boll. chim. farm., 1918, 57, 361-362.

The author has isolated a number of organisms which exert a fermentative action on the mannose obtained by acid hydrolysis of the manno-celulose of vegetable ivory waste remaining from the manufacture of buttons. These organisms also fermented sucrose, glucose, and maltose. The yield of alcohol is 10 to 15 liters per 100 kgm. of vegetable ivory. (Physiol. Abstr.)—G. H. S.

119. *The Industrial Application, Especially in the Distillery, of the Researches of Delavalle on the Pleomorphism of the Mucors*. P. BETTINGER. Bull. assoc. chim. sucr. dist., 1917, 35, 129-133.

The pleomorphism of the Mucors has been proved. In dilute media they appear slender, in concentrated media, short. If only a small amount of air is available the Mucor does not branch, with a medium supply it branches out well, and with an excess the branches become short, the Mucor assumes a knotted aspect and chlamydospores may even appear. (Physiol. Abstr.)—G. H. S.

## INDUSTRIAL MYCOLOGY

(See also Number 176)

120. *Oidium lactis*, the Milk Mould, and a Simple Method to Obtain Pure Cultures of *Anaerobes* by Means of It. M. W. BELJERINCK. Konin. Akad. v. Wetensch. te Amst., 1919, 4, No. 9.

*Oidium lactis* has the useful property of growing in compact masses which do not separate. Its food requirements are simple, and it does not produce any of the enzymes which are usually found in either yeasts or moulds. Its power of absorption of oxygen is considerable, and it will make ordinary air suitable for anaerobic cultures. A petri dish inoculated upon the surface of its medium with an anaerobe is placed upside down in a larger dish filled with liquid media inoculated with *Oidium lactis*. This double plate is incubated and the quick growing *Oidium* cultures absorb all the oxygen, and the anaerobic cultures develop readily.—J. V.

121. *Influence of Different Agents on the Saccharifying and Fermenting Powers of Mucor boudieri*. BETTINGER AND DELAYALLE. Bull. assoc. chim. suc., 1918, 35, 114-129.

In experiments on the cultivation of *Mucor boudieri* on sugared extract of malt comb the development of acid was found to be in direct proportion, within limits, to the access of air and the sugar content. Comparatively low temperatures gave the highest results. Succinic acid is the only non-volatile acid formed; acetic acid is the chief of the volatile acids. Nitrogenous matter at first retards but later accelerates saccharification; peptone and asparagin giving the best results. Ammonium sulfate has but little effect. Calcium and potassium phosphates, and to a less degree ammonium phosphate, accelerate saccharification; sodium phosphate produces little or no result. (Physiol. Abstr.)—G. H. S.

122. *Verstärkung der Katalasewirkung in Hefezellen—II.* (Activation of the Catalase Action in Yeast Cells—II.) H. v. EULER AND I. LAURIN. Ztschr. f. physiol. Chem., Strassb., 1919, 106, 312-316.

Activation of catalase action by chloroform was previously noted in a top yeast. This same phenomenon has now been observed in *Saccharomyces thermantimonum*. (Physiol. Abstr.)—G. H. S.

123. *The Sensitiveness of Living Yeast to Hydrogen and Hydroxyl-Ion Concentration*. H. von EULER AND F. EMBERG. Ztschr. Biol., 1919, 69, 349-364.

Both the symase and the life processes of the cell are concerned in fermentation. It appears that the enzyme exists in a free state within the cell. (Chem. Abstr.)—G. H. S.

124. *The Mycodermis of Wine*. G. DE ROSSI. Stas. sper. agrar. ital., 1917, 50, 529-562.

The existence of at least four species of typical mycodermis (*Ar. vini*, *duplex*, *tenax*, and *acidificans*) capable of producing "flower of wine" is clearly established. Their morphology and colony formation, the influence of alcohol and of the acids of wines, of temperature and of direct sunlight on their development, are described. (Physiol. Abstr.)—G. H. S.

125. *The Flora of Paper. Systematic and Biological Study of Chromogenic Fungi in Spotted Paper. Nature, Origin, Causes and Remedies of Alterations in Paper*. PIERRE SÉE. Thesis, Par., 1919; J. Pharm. chim., 1919, 20, 99-101.

The spots found in old books are due to fungi which form a special paper flora. Infection may be primary, during the manufacture of the paper, or infection may occur later. In culture experiments the conditions naturally found were reproduced. (Chem. Abstr.)—G. H. S.

## SOIL BACTERIOLOGY

126. *The Influence of Low Temperature on Soil Bacteria*. A. F. VASS. Cornell Agr. Exp. Sta., Mem. 27, 1919.

An investigation of the increase in plate count observed when soil is frozen, containing a full discussion of the literature on this subject.

The writer has made some counts from a sample of soil frozen in the field, and has also studied soil frozen in the laboratory for short periods. His counts are lower than those reported by other investigators; but he does find somewhat higher counts in soil that has been frozen and thawed than in unfrozen soil. One experiment seems to indicate that the plate count increases with successive freezings and thawings. The more rapid the thawing, in general, the higher the counts.

A determination was made to see whether ammonification and nitrification can go on in frozen soil. The results indicate little or no formation of ammonia or nitrate.

Cultures of *B. radicola* were frozen from various periods up to 6 hours in ice and salt and in liquid air. Liquid cultures showed a decrease in plate count when frozen; sand and soil cultures showed no appreciable change in count.

From these data the writer draws the conclusion that the increase of plate count in frozen soil is due to a breaking up of the clumps and not to an increase in the actual numbers of bacteria.—H. J. C.

127. *Note on the Flagellation of the Nodule Organisms of the Leguminosae.* ROY HANSEN. Science, N. Y. & Lancaster, 1919, N. s. 50, 568-569.

In a previous paper (Ill. Agr. Exp. Sta. Bull. 202) the writer claimed that the legume nodule organisms are monotrichic instead of peritrichic as various recent investigators insist. His conclusions were based largely on cultures obtained from soy bean and cowpea. Now he finds peritrichic flagella on cultures from clover, vetch, and alfalfa. This suggests the possibility that there may be two distinct groups of this organism; one peritrichic, the other monotrichic.—H. J. C.

128. *Nitrogen Fixation in Indian Soils.* C. M. HUTCHINSON. Agr. J. India, Calcutta, 1919, 14, 215-225.

Comparatively little study has been given to the non-symbiotic fixation of nitrogen in soils, so far as concerns its practical aspect, because of the small amount of nitrogen ordinarily thus obtained from the air; but the high temperatures in India tend to stimulate bacterial processes in soil. There is evidence that under favorable conditions in India large amounts of atmospheric nitrogen may be fixed; but that there is some unknown limiting factor that often prevents this. Various practical problems are thus suggested.—H. J. C.

129. *Nitrification in Egyptian Soils.* J. A. PRESCOTT. J. Agr. Sci., Cambridge, 1919, 9, 216-236.

The writer gives a brief discussion of agricultural practices and conditions in Egypt, pointing out that practically no investigation has been made of the activities of microorganisms in Egyptian soils. In his investigations he has taken the nitrate content of the surface soil as a criterion of the biological processes. He found the moisture content of the soil to be the chief limiting factor. He found a relatively large amount of nitrate in soil of a cotton field throughout the season, but no accumulation of nitrate under wheat and maize. Nitrification may go on steadily through the winter fallow. During the summer fallow the writer found very little nitrification, and thinks that the low moisture and high heat may partially sterilize the soil.—H. J. C.

130. *Rate of Nitrification of Different Green Manures and Parts of Green Manures and the Influence of Crop Residues on Nitrification.* N. V. JOSHI. Agr. J. India, Calcutta, 1919, 14, 395-409.

As a method for comparing the value of different legume plants of India as green manures, the writer adds them to soil and measures the rate of nitrate accumulation. Comparing 6 different legumes, he finds that the more succulent the plant, the less nitrate accumulates. Several possible explanations of this are mentioned. He compares further the amount of nitrate accumulating when roots, stems, and leaves are added separately, finding much greater accumulation with leaves than with either roots or stems. From this he concludes that leaves are the most valuable part of the crop as green manure.—H. J. C.

131. *Effect of Oxidation of Sulphur in Soils on the Solubility of Rock Phosphate and on Nitrification.* O. M. SHEDD. J. Agric. Research, Wash., 1919, 13, 329-345.

This is a report of work done in response to the call by Dr. J. G. Lipman of the New Jersey Station for cooperation in studying the value of phosphate-sulphur composts. Previous experiments have indicated that if sulphur is allowed to compost in soil with rock phosphate, the sulphur is oxidized to sulphuric acid which renders the rock phosphate soluble.

The writer finds that in 24 months' time 17 per cent of the total phosphorus may be converted into water-soluble form and 84 per cent into citrate soluble form. If the sulphur was omitted from the compost there was also an increase in the solubility of the phosphate but to a less extent. In the presence of sulphur there was a rise in acidity and sulphate parallel to that in soluble phosphate, indicating that the oxidation of the sulphur caused the solubility of the phosphate.

The best conditions to promote the activity are initial inoculation, high temperature, thorough aeration, and a fair moisture content. There is some variation in efficiency of different mixtures in the composts; taking into account cost of materials, the compost containing the larger amount of soil and some manure proved more desirable. The acid phosphate produced is as good as the commercial product, and would be cheaper if the time and labor could be disregarded. This method of manufacture might be of value under emergency conditions, but would hardly be profitable ordinarily. It is possible, however, that the process may be simplified so as to prove of practical importance.—H. J. C.

132. *Effect of Inoculation and Lime on the Amount of Nitrogen in Soybeans on Acid Soil.* E. B. FRED AND E. J. GRAUL. Soil Sci., Balt., 1919, 7, 455-468.

Tests were carried out with soybeans on sands and silt loams both in pots and in the field. Inoculations and lime were each found to increase the yield of dry matter as well as to increase the percentage of nitrogen in the crop. The maximum yields were obtained with inoculation and sufficient lime to neutralize one-half of the active soil acidity. When the entire crop is removed from the soil, leaving only the roots and stubble, there will be less nitrogen in the soil than before the crop was grown, but if the crop is turned under as a green manure, if properly inoculated, it will add large quantities of nitrogen to the soil. The tolerance of soybeans towards soil acidity is of practical importance in this connection when compared with clover or alfalfa.—N. K.

133. *The Oxidation of Vanillin to Vanillic Acid by Certain Soil Bacteria.* W. J. ROBBINS AND E. C. LATHROP. *Soil Sci.*, Balt., 1919, 7, 475-486.

A bacterium which uses vanillin with facility as an energy and carbon source was isolated from Alabama soil and inoculated in pure culture into solutions containing nutrient salts and vanillin. Vanillic acid was isolated from the above, and the properties and characteristic reactions studied. It was found, furthermore, that in such solutions vanillin is oxidized to vanillic acid. The vanillic acid first accumulates in the culture medium but is later destroyed.—N. K.

134. *Ammonia as a Product of Protein Transformation Caused by Mold Fungi and the Conditions of its Formation.* V. S. BUTKEVICH. *Rec. d'articles dédiés au Prof. C. Timiriazeff*, 1916, 457-499; *Physiol. Abstr.*, 1919, 4, 418, No. 2601.

The different species of fungi vary as regards their capacity to decompose proteins with formation of ammonia. It depends upon circumstances which compounds of the protein molecule can be utilized by a certain fungus. The mold fungi are capable of utilizing for the formation of ammonia not only amino- but also the amido-complexes. Both of these reactions were studied by the author, both with the mycelium and the expressed juice of *Aspergillus niger*. This fungus contains a ferment which is capable of transforming the amido-group of asparagin to ammonia. An alkaline medium is most favorable for its action. The ammonification of the amino group of amino acids can only be observed with living cells.—G. H. S.

135. *On the Acquisition of Gaseous Nitrogen by the Leguminous Tubercles.* TH. KRASHENINNIKOV. *Rec. d'articles dédiés au Prof. C. Timiriazeff*, 1916, 307-324; *Physiol. Abstr.*, 1919, 4, 424, No. 2631.

It is possible to observe the assimilation of free nitrogen by entire roots, as well as by those severed from their tubercles, if they are provided with a considerable quantity of oxygen, so that intensive respiration proceeds without hindrance.—G. H. S.

## PLANT PATHOLOGY

136. *Studies on Plant Cancers. 1. The Mechanism of the Formation of the Leafy Crown Gall.* MICHAEL LEVINE. *Bull. Tor. Bot. Club*, 1919, 46, 447-452.

Contrary to Smith's idea that the brown gall produced by inoculating plant tissues with *Bacterium tumefaciens* is identical with the atypical teratoid embryomata found in animals, Levine and Levine have contended that the leafy shoots are always secondary to the development of the crown gall, and that such differentiation of cells of a malignant tumor does not occur in animal cancer.

In this new paper Levine tells of his experiments with *Bryophyllum calycinum*, which he inoculated with *B. tumefaciens* under the epidermis, in midribs and other regions to determine whether or not the presence of the bacterium gave any added stimulus to the abundance of leafy shoots produced.

His results indicate that *Bacterium tumefaciens* introduced into the marginal notches of a leaf of *Bryophyllum calycinum*, into the tissue of a leaf near a small bud, or into the mid-vein of a leaf, result in the formation of galls without the development of the bud or leafy shoot; that the growing region of a young stem produces first the crown and later occasionally a leafy shoot develops.

Therefore the author concludes that *B. tumefaciens* does not cause the formation of leafy shoots in *Bryophyllum*, but rather inhibits and retards their normal development, when inoculated into the totipotent cells which appear at the notches of the leaf.—J. T. E.

137. *Bacterial Blight of Soybean.* FLORENCE M. COEPPER. *J. Agric. Research*, Wash., 1919, 18, 179-193.

Although probably not a new disease, the writer has not found any reference to it in the literature. It is primarily characterized by small angular spots on the leaves, but petiole, stem and pod lesions accompany those on the leaves. The writer has isolated the causal organism and has carried on successful infection experiments with it. It is a *Pseudomonas* form with one to several polar flagella, which the writer (following the nomenclature of E. F. Smith) names *Bacterium glycineum*.—H. J. C.

138. *Cotyledon Infection of Cabbage Seedlings by Pseudomonas campestris.* CHARLES DRECHSLER. *Phytopathology*, Balt., 1919, 9, 275-308.

The author points out that the method by which cabbage seedlings are infected with the black rot organism has never been fully established. To investigate the matter he has grown seedlings in soil heavily infested with *Ps. campestris*. The first sign of infection has always appeared around the water pores, no evidence having been obtained to indicate infection through the roots.—H. J. C.

## DAIRY BACTERIOLOGY

139. *Die Bakterienflora von frischen und benutzten Streumaterialien, mit besonderer Berücksichtigung ihrer Einwirkung auf Milch.* (*The Bacterial Flora of Fresh and Used Straw Materials, with Especial Attention to their Effect on Milk.*) R. KÜRSTEINER. Centralbl. f. Bakteriöl. (etc.), Jena. II. Abt., Orig., 1916, 47, 1-191.

A long treatise on the bacterial flora of various different kinds of straw, both in a fresh condition and after used as a litter under animals. The results are too lengthy to be summarized in a few words. The writer not only makes plate counts of the straw, but names many organisms isolated from the material. He finds the reaction in milk of considerable importance in comparing the different kinds of straw, obtaining his results by inoculating fresh milk and sterilized milk with portions of the straw under investigation.—H. J. C.

140. *Dairy Infection with Streptococcus epidemicus.* J. H. BROWN AND M. L. ORCUTT. J. Exper. M., Balt., 1920, 31, 49.

In an examination of throat cultures in 15 children suffering with sore throat with sub-maxillary and cervical lymphadenitis, all of whom used milk from the same dairy, the *Streptococcus epidemicus* Davis was found in large numbers in 12. A careful study of the dairy revealed this organism present in the throat cultures from several of the employees, and in one quarter of the udder of a single cow out of the entire herd of 112 examined. Although the milk from this infected cow at the time of first examination appeared normal, it later became thick and yellow. All the strains isolated from the above mentioned sources were identical culturally, and conformed to the human type, according to the various criteria described in the author's previous paper.

It is recommended that throat cultures of milkers be taken regularly and that routine milk counts be made on blood agar rather than plain agar.—W. P. B.

141. *La recherche des qualités normales du lait par la culture de microbes appropriés.* (*Investigation of the Quality of Milk by the Cultivation of Appropriate Organisms.*) J. LIGNIERES. Compt. rend. Soc. de biol., Par., 1919, 82, 1094.

The milk in question is compared with a normal milk by the inoculation of both samples with certain organisms and by following the reaction changes which occur. The three organisms selected are usually: a *Pasteurella*-organism of chicken cholera; a strain of *B. coli* or of streptococcus; and third, a bovine *Salmonella*—*B. paratyphosus* B. Abnormalities in the milk under examination are detected by deviation from the typical reactions produced by these organisms in normal milk.—G. H. S.

142. *Clean Milk.* C. I. CORBIN. Cornell Vet., Ithaca, 1919, 9, 214-219.

The author states that the cow and her condition in her surroundings, is the principal factor. The construction of a sanitary, practical stable is briefly outlined. A plan for a milk house and its necessary requirements is discussed, together with the proper method for handling and cooling milk. Great emphasis is placed upon the careless manner in which milking machines are cared for after being used. It is recommended that each set of milking-tubes be placed in 10 gallons of a proper antiseptic solution which is made by adding 18 to 24 ounces of chloride of lime to 15 gallons of water. It is further advocated that bacteriological laboratories be established at all milk stations and that each farmer's milk be examined bacteriologically when received and paid for on a standard of cleanliness.—C. M. C.

143. *A Study of the Electro-pure Process of Treating Milk.* ARTHUR K. ANDERSON AND RUBIN FINKELSTEIN. J. Dairy Sci., Balt., 1919, 2, 374-406.

The installation of an electro-pure pasteurizer at Camp Meade gave the opportunity for this study. In this pasteurizer after preheating to 40°C. the milk passes to a supply tank after which it is fed into a series of porcelain cups containing electrodes. When in operation the milk closes the circuit. Due to resistance the temperature of the milk is raised to about 70°C. The current used is alternating and has a high voltage. With this particular machine, the voltage is 2300, the amperage is 14 and the frequency 25. A three-phase system of wiring is used. The cost of the electric treatment amounted to about 1 cent per gallon.

The results secured indicated that the process gave a very satisfactory reduction in count under the conditions of operation, and effectively destroys nearly all lactose-fermenting, Endo-positive organisms. The milk kept well for about 5 days at 5° to 10°C. and soured normally in 48 hours when kept at room temperature. Studies indicated that in this machine the killing of the bacteria was apparently due to the heat produced rather than to the electric current itself. The process furnishes a method of subjecting the milk to a very sudden high temperature for a brief period of time. The tests on albumen, cream line, peroxidase and feeding value showed the process to leave these things practically unchanged. The time required for coagulation with rennin was increased and the action of reductase was weakened. However, certain difficulties developed in the course of the operation of the machines which made it necessary to remodel them, and the authors conclude that the machine in operation at this time was not entirely successful in long continued operation, and that modifications must be made before the machines can be considered a commercial success.—R. S. B.



144. *Supervision of the Pasteurized Milk Supply of the State.* THEODORE HORTON. Health News, Albany, 1919, 14, 278-280.

There are about 600 milk pasteurizing plants in New York State, 350 of which contribute almost exclusively to New York City, the remaining 250 to municipalities up state. Most of the plants contributing to New York City were kept in satisfactory condition by effective supervision of the city health authorities; many of the others, however, showed great need of attention. These investigations were limited to a careful field inspection of equipment, method of operation, and sanitary conditions in and about the plant. A set of rules and regulations was adopted to constitute a standard to which these plants must conform. The latter part of the paper is concerned with a general discussion of the method of pasteurization. —F. W. T.

145. *The Mould of Blue-Veined Cheeses.* DAN W. STEUART. J. Dairy Sci., Balt., 1919, 2, 407-414.

This is a report on studies from University College, Cardiff, upon the moulds of the French Roquefort, the Italian Gorgonzola, the English Stilton, Wensleydale and blue-Dorset, and the less commonly known Welsh blue-Caerphilly. After pointing out that the name *Penicillium glaucum* usually used in Wales for the moulds in these cheeses is too general, he refers to the work done by Thom and Currie in America upon these moulds and their work on the variety which they call *P. roqueforti*. Of a dozen blue cheeses which the author of the paper examined he found the Roquefort mould to be thoroughly dominant in eight, present in a ninth, but apparently absent from the remaining three. Following this, the author successfully used pure cultures of *P. roqueforti* to inoculate the curd used in making Wensleydales and Stiltons and imitation Roquefort. —R. S. B.

## COMPARATIVE PATHOLOGY

(See also Number 233)

146. *Some Morphological and Biological Characters of the Spirilla (Vibrio fetus, N. Sp.) Associated with Diseases of the Fetal Membranes in Cattle.* THEOBALD SMITH AND MARIAN S. TAYLOR. J. Exper. M., Balt., 1919, 30, 299-311.

A spirillum isolated from cases of infectious abortion in cattle is described. Twenty-two fetal strains were studied; all obtained from one herd.

The organism varies from minute S-shapes to long forms extending across the whole microscopic field. The small forms are exceedingly motile, the long ones more sluggish. The organism may have a flagellum at one or both poles, and granules are visible on or within the body, more commonly in old cultures.

Growth is obtained in agar slants having some water of condensation or a little bouillon. The slants are inoculated with a small bit of tissue or of stomach or intestinal contents of the infected fetus and the tubes sealed with sealing wax. A slight delicate growth may become visible in 3 or 4 days especially about the bottom of the slant between the agar and the glass. The water of condensation becomes cloudy and surface growth occurs only exceptionally. After months of artificial cultivation growth is more hardy and in sealed tubes may occur on the surface, the water of condensation showing a viscid, whitish sediment possibly due to a kind of mucoid degeneration. In the earliest growths fluid media failed, as a rule, to induce multiplication. Agar slants are believed to offer the best medium for cultivation; saprophytized strains will grow well in agar shake cultures. All strains should be transferred weekly, as viability varies greatly.

In its physiological characteristics *Vibrio fetus* is believed to be somewhat related to *Bact. abortum*. The vitality of the vibrio remains higher when kept at room temperature than when kept in the ice box at 5° to 6°C. It does not form indol in bouillon and no gas is produced and little or no acid in 1 per cent dextrose, lactose and saccharose. It is very sensitive to drying, being killed by 3 hours' exposure on threads at room temperature. It can withstand a temperature of 55°C. for 5 minutes.

Agglutination experiments performed with the sera of rabbits immunised against some of the strains indicate that the fetal strains are serologically the same. One strain differs in certain respects, but is similar in agglutinating affinity. —I. W. P.

147. *The Etiological Relation of Spirilla (Vibrio fetus) to Bovine Abortion.* THEOBALD SMITH. J. Exper. M., Balt., 1919, 30, 313-323.

Mention is made of bacteriological findings in the fetus and pathological changes in the placenta with cases of bovine abortion. In only one case was *B. abortus* isolated, while *Vibrio fetus* was isolated from all cases, indicating that *B. abortus* is not the chief etiological factor in these cases, except when a herd is first attacked and susceptible, or in first pregnancies.

*Vibrio fetus* may be (a) the true etiologic agent causing disease of the fetal membranes or (b) an invader from the external genital tract or (c) an invader from the blood after the fetus has been injured or killed by other non-bacterial agencies. Inoculation of cultures of *Vibrio fetus* intravenously into 4 pregnant cows showed that in 2 cases the organism was present in the diseased fetal membranes after birth, while *B. abortus* was absent. *B. abortus* was agglutinated by the sera of these 2 animals only in  $\frac{1}{16}$  dilution, though the sera of 1 of the

2 cows that failed to show *Vibrio fetus* in the membranes agglutinated it in a dilution of  $\frac{1}{16}$ , a fact explained by the presence of *B. abortus* in the milk, pointing to an old infection in some earlier pregnancy. Failure to infect the fetal membranes of two of the cows by intravenous injection of *Vibrio fetus* may have been due to decline or absence of virulence of the organism or to increased resistance of these particular cows.—I. W. P.

148. *The Bacteriology of Bovine Abortion, with Special Reference to Acquired Immunity.* THEOBALD SMITH. J. Exper. M., Balt., 1919, 30, 325-339.

An account is given of the bacteriological examination of 109 cases of abortion occurring in a large herd of dairy cattle and young stock. A relatively thorough study was made of the foetus and of the membranes, or of uterine swabs, the following results being obtained:

Abortions associated with <i>Bact. abortus</i> .....	62, or 57 per cent
Abortions associated with Spirilla.....	26, or 23.8 per cent
Abortions associated with <i>B. pyogenes</i> .....	2, or 1.8 per cent
Sterile or associated with secondary invaders.....	19, or 17.4 per cent

\* *Bact. abortum* being absent in these cases.

The large number of abortions in the absence of *Bact. abortum* is noteworthy, since it has previously been taken for granted that this organism was the sole infecting agent in such cases. In general *Bact. abortum* was associated with first pregnancies, its incidence decreasing with repeated pregnancies, showing the production of an acquired immunity. The relation of infection with spirilla to acquired immunity is not clear and more data from large herds are needed to define both etiological and immunological bearings of the spirilla. Thus far spirilla have not been encountered in native heifers giving birth the first time, due possibly to segregation of young stock until just before calving. The occasional discharge of a fetus among the young stock in pasture tends to keep up infection with *Bact. abortum*, and later association with older cows leads to infection with spirilla (*Vibrio fetus*), and occasionally with other possible agencies of fetal disease. On the other hand, abortions may occur among the pastured stock from time to time and remain unrecognized. Not until the young stock and the older purchased cows are subjected to the same daily scrutiny will it be possible to affirm that abortion associated with spirilla does or does not occur among young stock.—I. W. P.

149. *An Interpretation of the Agglutination Reaction to Bacillus Abortus in 75 cases of Bovine Abortion Bacteriologically Controlled.* ERNEST W. SMITH, RALPH B. LITTLE AND LAURA FLORENCE. J. Exper. M., Balt., 1919, 30, 341-357.

The results of a study of agglutinins for *B. abortus* made in 75 cases of bovine abortion are here presented. The tests were so planned as to give the entire range of serum dilutions to the limit of clumping. The time since the occurrence of the abortion and the duration of the infection in the pregnant uterus were found to determine the agglutinating titer, the potency of the serum from old abortions having fallen off, while that from cases infected shortly before the abortion occurred had not reached a high titer at that time. Furthermore, the presence of *B. abortus* in the udder determines, in many cases, the intensity of the reaction, so that no definite rules can be formulated for the quantitative interpretation of the agglutination reaction since it is bound up with a complicated process varying from case to case. In the individual cow, in general, a titer of  $\frac{1}{16}$ , or less, may be regarded as indicating that the cow is not infected with *B. abortus* at the time of the blood examination. This, however, does not exclude former infections in older cows, nor does it absolutely exclude very recent infections, as stated above. The highest titers  $\frac{1}{16}$  and above, generally indicate recent infection and, in the absence of recent premature births, infection of the udder. Even when abortion has just occurred, it may be due to other agencies, and the high titer be maintained by a chronic infection of the udder dating from an earlier uterus infection with *B. abortus*. Intermediate titers may indicate a gradual rise or decline of agglutinins preceding or following abortion without infection of the udder. They may also stand for a relatively high resistance or partial immunity of the cow.

In any herd a uniform titer of  $\frac{1}{16}$  or less in all animals may be regarded as indicating the entire absence of *B. abortus*. A high titer in any one cow indicates quite definitely the presence of infection in the herd. A bacteriological study of the milk and of any prematurely discharged fetus is required to determine more accurately the character of the infection in any one cow.—I. W. P.

150. *Researches upon a Spirillum Associated with Abortion in Ewes.* C. M. CARPENTER. Cornell Vet., Ithaca, 1919, 9, 191-203.

The history of abortion in sheep and the experimental work done are briefly reviewed.

Studies were made in a flock of 235 pregnant ewes where abortion was prevalent. The ewes had passed through first pregnancy normally and this was their second pregnancy. The animals were in very poor condition physically and showed the common symptoms of abortion and retained afterbirth seen in cattle. About 100 ewes expelled either dead and mature, or dead or living and immature fetuses. The ewes would have nothing to do with their lambs.

A bacteriological examination was made of 20 of the fetuses and 6 of the uteri. A spiral-shaped organism was recovered in culture from 11 of the fetuses and from 2 of the uteri. This

organism was very motile and grew under reduced oxygen tension. The organism appeared like the letter S in many cases but the majority of forms consisted of a curve and a half. The length of the single short forms varied from 1.5 to 2.5 microns and the width from 1 to 2 microns. The amplitude of the curves varied from 0.5 to 0.8 micron. In some cases the organism was mixed with a streptococcus.

The livers of 3 of the fetuses showed lesions resembling those found in turkeys suffering from infectious entero-hepatitis. The stomach contents contained much meconium.

Two pregnant ewes and two pregnant cows were injected intravenously with 10 cc. of the stomach contents of fetuses containing the S-shaped organism. One ewe expelled a dead lamb and one a live lamb. The organism in question was recovered from the uterus and placenta of the ewe expelling the live lamb. One cow aborted unseen and the second expelled a live calf at full term weighing 49 pounds. Guinea pigs injected with the organism show no ill effects.

In the discussion the author points out the similarity of this S-shaped organism to the vibrio isolated by McFadyean and Stockman from aborting ewes and to the spirillum isolated by Smith from the aborted bovine fetuses. It is highly probable that the spirillum plays an important part in producing the above conditions in pregnant ewes.—C. M. C.

151. *The Cause of Abortion in Mares.* C. MURRAY. J. Infect. Dis., Chicago, 1919, 25, 341-348.

An account is given of a short, thick, motile, Gram-negative bacillus isolated from an outbreak of abortion in mares. Its cultural characteristics are minutely described, and it is said to belong to the paratyphoid-enteritidis group. Its dry, brittle, membranous growth on slanted agar is especially characteristic. It is thought to be the same organism previously described by Good, Meyer and others, and variously named by them *B. abortivo-equinus*, *B. abortus equi*, etc.

Abortion was produced with similar pathological findings in the rabbit, guinea pig, sow and mare in 2, 6, 2 and 11 days, respectively, by intraperitoneal or intravenous injections of minute doses of the organism (1 to 2 loop fulls). Feeding and intravaginal introduction of the bacillus failed to produce abortion in any animal thus treated.

The bacillus is agglutinated by immune sera prepared with the organisms of the paratyphoid-enteritidis group in fairly high dilutions, in some cases over 1:100. Serum of rabbits immune to this organism also agglutinates *B. suispestifer*, *B. enteritidis* and *B. paratyphosus*. A and B in dilutions high enough to indicate a close serological relationship to these organisms.—I. W. P.

152. *Le sang normal du cheval. (Normal Horse Blood.)* H. BONARD. Schweiz. Arch. f. Thierh., Zurich, 1919, 61, 160.

Several hundred determinations were made of the density and hemoglobin content of horse blood. The factors influencing the density and hemoglobin content are given. Density and hemoglobin content are of great value in the diagnosis of anemia and pulmonary empyema, as under these conditions the density may be as low as 1029 and the hemoglobin content 27 as measured by the Sahli hemometer.—P. M.

153. *Quelques observations sur la lymphangite épidémiotique. (Observations on Epizootic Lymphangitis.)* CAPMAU. Bull. Soc. Cen. Méd. Vét., Par., 1918, 94, 337-360.

The methods of Velu and of Belin for pyovaccination and autopyovaccination, respectively, are compared. It is concluded that both methods give excellent results but that the autopyovaccine method has the disadvantages of the difficulty in procuring sufficient pus and the danger of abscesses at the point of inoculation. The reactions are considered resulting from phagocytosis rather than from immunity. Case reports are given.—W. G.

154. *Des lymphangites contagieuses du cheval.—A: Nouvelle terminologie.—B: Contribution à l'étude du traitement par la pyothérapie. (The Contagious Lymphangitis of the Horse.—A: New Terminology.—B: Contribution to a Study of the Treatment by Pyotherapy.)* M. BELIN. Bull. Soc. Cen. Méd. Vét., Par., 1918, 94, 243-251.

A classification of equine lymphangitis with reports of typical cases and treatment.—W. G.

155. *Etude chimique des cultures du Cryptococcus de Rivolta. (Chemical Study of Cultures of the Cryptococcus of Rivolta.)* L. MUSSO. Compt. rend. Soc. de biol., Par., 1919, 82, 1271.

The cryptococcus of epizootic lymphangitis does not ferment the sugars. Alcohol and free acids were not detected. The mono- and di-saccharides which are utilized are entirely oxidized and eliminated as CO<sub>2</sub> and water. For the development of the cryptococcus the hexoses, particularly glucose, are most favorable. Saccharose is apparently utilized but it is not inverted. Peptone is utilized with the production of ammonia. The organisms contain about 83 per cent water.—G. H. S.

156. *Hemotoxins in Parasites of Horses and Man and Their Relation to Pernicious Anemia.* R. SEYDERHELM. München. tierärztl. Wehnschr., 1917, 535.

Seyderhelm claims to have reproduced artificially pernicious anemia of horses by repeated injections of aqueous extracts of the gastrous larva from healthy as well as from affected horses. Such artificially produced anemia, which may be also transmitted to healthy horses

is according to the investigations of Seyderhelm induced by a toxin named as oestrin which is contained in the larva. It is peculiar that the oestrin does not affect the red blood corpuscles in a test tube and only acts as a severe hemotoxin in the body of the animal. Oestrin contained in 5 to 6 gastrous larvae, is sufficient to kill a horse within several minutes with the most severe symptoms of intoxication. Especially toxic is the *Gastrophilus hemorrhoidalis*; the oestrin contained in a single representative of this larva killed a horse following an intravenous injection. The anemia of man caused by the bothriocephalus is also produced by an analogous hemotoxin, bothriocephalin. Seyderhelm has further found hemotoxins in tape-worms and round worms of men and animals. These hemotoxins must be considered as the true causes of pernicious anemias of parasitic origin.—A. E.

157. *Notes on the Intoxication by Gastrophilus Larvae.* G. V. D. DE KOCK. The Fifth and Sixth Repts. of the Director of Veterinary Research Union of South Africa. Dept. of Agr. Pretoria, 1918, 651-694.

Larvae of *Gastrophilus* contain a toxic substance which passes through the pores of a Berkefeld filter. This substance produces symptoms of intoxication in horses, mules, donkeys, sheep and goats when extracted and injected subcutaneously, intrajugularly and by drenching. Cattle, dogs, rabbits and guinea pigs are refractory to the toxin. The symptoms observed in horses which are most susceptible to the toxin cannot be explained on the lines of an anaphylaxis in view of our present knowledge of the subject.

Eighty per cent of horses that died of diseases other than pernicious anemia showed the presence of *Gastrophilus* larvae and aneurism of the anterior mesenteric artery. Watery extracts of *Gastrophilus* larvae taken from horses that died of diseases other than pernicious anemia cannot produce pernicious anemia when injected into susceptible horses. Watery extracts and filtrates of *Gastrophilus* larvae taken from horses dead of pernicious anemia can produce the disease when injected into susceptible horses. Watery extracts of *Gastrophilus* larvae taken from horses dead of horse sickness can produce horse-sickness when injected into susceptible horses. Of four susceptible horses injected with the filtrate (through a Berkefeld filter) of *Gastrophilus* larvae taken from horses that died of horse-sickness none contracted horse-sickness.—B. S.

158. *The Use of Carbon Bisulphide in Infestations with Bots, Gastrophilus SPP.* M. C. HALL. J. Am. Vet. M. Ass., Baton-Rouge, 1919, 56, 265-270.

Carbon bisulphide is an efficient agent in the removal of bots. A single 6 dram dose, preceded by a short period of fasting, is recommended. The use of linseed oil following this agent is not encouraged. Its use has no advantage and may cause superpurgation under certain conditions.—W. A. B.

159. *Fèvre typhoïde du cheval et anémie infectieuse. (Typhoid Fever of the Horse and Infectious Anemia.)* J. BASSET. Compt. rend. Soc. de biol., Par., 1919, 82, 1262.

Typhoid fever and infectious anemia are distinct diseases.—G. H. S.

160. *On the Occurrence of Thrips Sp. in the Skin Scrapings of Horses.* A. W. NOEL MILLERS. Vet. J., Lond., 1919, 75, 124-125.

The parasite *Thrips cerealium* has been observed in skin scrapings from horses that had been worked near certain grains. Thripidae are usually found on various grains and are recognised as cereal parasites. No local or general pathological significance was ascribed as the result of the occurrence of this parasite. A detailed description of it is given.—H. C. H. K.

161. *A propos de la gâle. (Concerning Scabies.)* L. CAZALBOU. Bull. Soc. Cen. méd. vét., Par., 1918, 94, 233-243.

A general discussion on the nature of the disease, its effects on the horse, and its treatment.—W. G.

162. *Traitement de la gâle par les solutions sulfo-crésylées. (Treatment of Scabies by Sulpho-cresol Solutions.)* M. J. DESCAZEUX. Bull. Soc. Cen. méd. vét., Par., 1918, 94, 273-279.

A description with drawings of dipping vat and a number of formulæ based on cresol, arsenious acid, polysulphide of potassium and carbonate of soda with and without oil. Also a discussion of the preventive treatment for scabies.—W. G.

163. *Le traitement de la gâle. (Treatment of Scabies.)* CHAMPETIER. Bull. Soc. Cen. méd. vét., Par., 1918, 94, 282-286.

A brief article on the treatment of sarcoptic scabies of the horse in the French armies during the war. Along with other measures there was used an aqueous solution of polysulphide of potassium, arsenate of soda and tobacco juice.—W. G.

164. *Sur le traitement des trypanosomiasés animales au Soudan. (The Treatment of Animal Trypanosomiasis in the Sudan.)* M. G. CURASSON. Bull. Soc. Cen. méd. vét., Par., 1918, 94, 482-488.

The trypanosomiasis of horses, cattle, zebus, and dromedaries were treated with atoxylpicric acid and with emetine-picric acid combinations.—W. G.

165. *Sur le tétanos expérimental du cheval. (Experimental Tetanus in the Horse.)* J. BASSET, MONVOISIN AND PINCEMIN. *Compt. rend. Soc. de biol., Par.*, 1919, 82, 1261.

Various quantities of toxin were injected. The period of incubation averaged about 4 days, the duration of the disease averaged about 2 days.—G. H. S.

166. *Aetiologisches zur Aktinomykosekrankung. (Etiology of Actinomycotic Infections.)* W. ODERMATT. *Schweiz. med. Wchnschr.*, 1920, 1, 26-29.

The literature on actinomycotic infection is reviewed and 8 case reports are appended.—G. H. S.

167. *Anthrax.* M. C. GUPTA. *Vet. J., Lond.*, 1919, 75, 6-14.

This article deals with anthrax as particularly affecting elephants. The author states that of herbivorous animals elephants are the most susceptible, and fatigued, emaciated or chilled individuals are more susceptible than healthy ones. Affected animals generally get the attack about an hour before daybreak, when the electric tension, atmospheric pressure and temperature are usually lowest. Elephant carcasses dead of anthrax decompose rapidly and as a rule become bloated, *rigor mortis* is incomplete, dark red blood escapes from the body openings and there are extensive serous infiltrations and extravasations of blood in different parts of the body. In the way of treatment, a preparation of salvarsan has been used with some success, but cardiac stimulants must be administered along with this, otherwise patients will die from failure of heart.—H. C. H. K.

168. *Notes on an Ephemeral Fever of Indian Cattle Resembling South African "Three Day Sickness."* D. MEADOWS. *Vet. J., Lond.*, 1919, 75, 138-140.

The disease is characterized by its sudden onset, high temperature at the beginning but a return to normal within 3 to 4 days, marked by stiffness, anorexia, cessation of rumination, accelerated pulse and respiration and difficult swallowing. The disease appears usually after the rainy season, July to October. The etiological factor is not known, but is thought to be fly-borne. Common vernacular names are given to recognize this in the Punjabi such as "Vil" and "Bilho."—H. C. H. K.

169. *Glanders Infection in Sheep and Cattle.* BIERBAUM AND EBERBECK. *Ztschr. f. Veterinärk., Berl.*, 1918, 30, 1.

According to present experience sheep are highly refractory to artificial glanders infection and cattle appear to be immune. Recent investigations of Bierbaum and Eberbeck proved that both species of animals are susceptible to infections with glanders bacilli and especially that cattle possess no absolute immunity to glanders. The acute cause of experimental glanders infection in sheep indicates that their susceptibility to glanders is not so slight as has been assumed, and that spontaneous infections in sheep may develop from exposure to glandered horses. In cattle, however, susceptibility is slight. This is substantiated, aside from the negative results of other authors by the observation that in a test calf glanderos changes were relatively slight and showed degenerative changes in the form of calcification. Nevertheless the spleen contained, 39 days after inoculation, living glanders bacilli. The authors claim that the morphologic and cultural characteristics of the glanders bacillus are not alone sufficient to establish a diagnosis without blood examination and test inoculations. For rapid identification they recommend the preparation from the suspicious cultures of a bacterial extract and the examination of its antigenic properties with a strongly fixing specific glanders serum. This procedure leads at the longest in two to three days to certain identification as compared with the very slow process required by animal tests.—A. E.

170. *The Purification and Concentration of Hog Cholera Serum.* EDWARD RECORDS. *J. Am. Vet. M. Ass., Baton-Rouge*, 1919, 56, 291-302.

This work was undertaken to determine whether it was possible to refine and concentrate hog cholera serum by a process similar to that used in making the globulin products from antiphtheritic sera. It was found that the antibody content could be recovered in a single precipitation. Sterilization and clarification of the precipitate is not practical.—W. A. B.

171. *Prevention of Hog Cholera.* C. N. HACKETT. *Cornell Vet., Ithaca*, 1919, 9, 181-190.

Enormous losses occur annually during the shipment of hogs. In 1918 a total of 1,054,000 pounds of dead hogs arrived at the St. Paul Union Stockyards. This was a loss to the owners or shippers of \$157,750.

The author believes that veterinarians could have prevented 90 per cent of this loss to the shippers by instructing them how to care for the animals preparatory to and during shipment.

Hog cholera in general is on the decline in the United States. During 1918, the B. A. I. inoculated 5½ millions of hogs with antihog cholera serum. In the state of Minnesota the percentage of losses has been reduced from 19 in 1914 to 2.2 in 1918. It is estimated that 90 per cent of all hogs that are lost die from hog cholera.

The diagnosis is made by the characteristic symptoms confirmed by post mortem lesions. The only preventive that is safe is the anti-hog cholera serum or the serum and virus treatment. The temperature of each hog should be taken before the serum or virus is used. This alone would eliminate much of the trouble arising from their use. The method of administering serum, the dosage and the after care of the hogs are briefly described.—C. M. C.

172. *Eziologia della pneumo-enterite dei suini. (Etiology of Swine Pneumo-Enteritis.)* A. DELGADO. Ann. d'ig., Roma, 1919, 29, 399.

The author has not been able to find a filterable virus in a few epidemics of swine pneumo-enteritis, but has found *Bact. suisepiticum*. This shows that from the experimental, clinical and anatomo-pathological point of view, pneumo-enteritis may be due entirely to *Bact. suisepiticum*. The inoculation of this organism produces an experimental infection having all the characteristics of pneumo-enteritis and when used as a vaccinating material produces immunity. There is not always a direct relation between filterable virus and swine pasteurella.—P. M.

173. *Untersuchungen an gesunden und pestkranken Schweinen über das Vorkommen des Ferkel-typhusbacillus. Ein Beitrag zur Frage der primären Pathogenität dieses Mikroorganismus sowie des Vorkommens von Bakterien aus der Coli-Typhus gruppe bei Schweinen. (Studies on Healthy and Cholera Swine as to the Presence of the Pig Typhoid Bacillus. A Contribution to the Question of the Primary Pathogenicity of this Microorganism, as Well as to the Presence of Bacteria of the Colon-Typhoid Group in Swine.)* EMIL TORMANN. Centralbl. f. Bakteriöl. (etc.), Jena. I. Abt. Orig., 1919, 82, 532-559.

The pig typhoid bacillus was not found in the alimentary tracts of 226 healthy swine. The assumption is not warranted that it can develop pathogenic characteristics in cholera swine, as has been asserted by Uhlenhuth and others for the paratyphoid Gärtner group.

In 75 cases of primary virus pest it was not possible to demonstrate the pig typhoid bacillus as causing secondary infection. The biochemically and serologically distinct *Bacillus suispestifer* Kunsendorff was found commonly. In all cases where the pig typhoid bacterium was isolated from the organs, there was present the characteristic intestinal and pulmonary lesions, and the whole course of the attack in the particular herd differed from true hog cholera (virus pest).

Pig typhoid is a distinct entity with its characteristic course and lesions; secondary *B. suispestifer* infection does not show distinct or peculiar pathologic-anatomic lesions.

The bacillus of pig typhoid is placed biochemically in the colon typhoid series between paratyphoid B and typhoid. It is only slightly if at all agglutinated by sera homologous for paratyphoid Gärtner strains originating for the most part from human sources, but in high titer by sera homologous for somewhat similar strains of animal origin. The study shows the error of terming *B. suispestifer* every bacterium isolated from cholera swine.—R. E. B.

174. *Au sujet de quelques souches paratyphiques. (Some Paratyphoid Strains.)* R. BRUYNOGHE. Compt. rend. Soc. de biol., Par., 1919, 82, 954.

Strains of an organism resembling *B. paratyphosus* B were isolated in the Belgian Congo from epizootic abortion in mares. Culturally and serologically it conforms to paratyphoid B. The organism known as *B. typhi gallinarum alcalifaciens* possesses great resemblance to *B. typhosus*. The bacillus of hog cholera, while resembling paratyphoid B morphologically and culturally seems to be an individual race.—G. H. S.

175. *Die Lungenstrongylose und die Knotenseuche der Kaninchen. (Strongylosis of the Lungs and Nodular Disease of Rabbits.)* SUSTMAN. Deutsche tierärztl. Wehnschr., 1919, 27, 95-97.

1. *Lung strongylosis.* The larvae (wurmbrut) taken with food and water pass from the stomach and intestines into the blood and lymph, whence to the bronchioles and alveoli, where fertilization and deposition of ova take place. Larvae are eliminated with the lung discharges directly or with the feces after the coughed up material is swallowed.

Frequently the only evidence of disease is found at the time of slaughter. In the frank cases, sneezing, coughing, nasal discharge, difficult breathing, rough coat, general debility and loss of weight are found. In the acute form the animals die within a few days with apnea and general debility. The young rabbits succumb most readily.

Autopsy shows the principal changes to be in the lungs, on the serous covering of which, nodules of various sizes are sometimes found. The thoracic lymph glands may be swollen, firm, round, with glassy, glistening appearance; they contain a fluid or yellowish cheesy material which, upon microscopic examination, shows small round worms together with multiplication products and disintegrated lung tissue. The bronchioles contain innumerable strongyli. The worms are very thin and round, pointed at one end and blunt at the other. Males are 18 to 30 mm. long, while the females are 28-50 mm. They are 0.25-0.40 mm. in width.

Treatment is of little avail—fumigation with tar preparations gives the best results. Greater progress, however, can be obtained by preventive measures such as slaughter of diseased animals, burning of feces and litter and disinfection of the hutches and utensils. Infected runs should either be avoided or treated with slaked lime and ploughed up. Care should be taken to secure food grown on uninfected ground.

2. *Nodular disease.* The primary causative agent of the disease is unknown. Occasionally *B. necrophorus* is found in the disintegrated mass; nevertheless this organism cannot be considered the specific causative agent.

Probably the infection is transmitted during copulation, although alimentary and other avenues of infection cannot at present be entirely discarded. The most important manifestation of the disease is swelling of one or both testicles. These are often ten times the size of the normal organs, firm and cucumber-like in form. Intensive reddening of the skin around

the genital organs or painfulness upon pressure of the affected organs could not be demonstrated. Striking, sometimes, was the dullness, roughness of coat, and the failure frequently to cause conception after service. In progressive cases, emaciation, definite weakness, difficulty in locomotion and diminished appetite are observed. Death, when not sudden, is caused by asthenia.

At autopsy, one finds not only changes in the genital organs, but also irregular, whitish nodules, varying in size and consistency in the kidneys, intestines, spleen, liver, lungs, upon thoracic and abdominal serosae and in the lymph glands; otherwise, these organs show no abnormality. Lesions remind one of progressive tuberculosis. The nodules are imbedded deeply in the tissues, and consist of firm or cheesy masses separated with difficulty from the surrounding tissue. The intestines in the affected portions show a pronounced thickening of the entire wall. The mucous membrane shows a flat, ulcerous, grayish-white smeary or gritty mass, with the adjacent mucous membrane necrosed. The lesions in the spleen, liver, kidney and lungs appear to be due to metastasis.

Treatment. In the early stages animals may be castrated, but in the disease they should be immediately slaughtered.

Prevention includes the exclusion from breeding service of animals that show disease of the genital organs, regular disinfection of hutches and the slaughter or isolation of animals that show loss of weight and weakness.—J. T.

176. *Pneumomycosis aspergillina Leporis cuniculi* L. (*Pneumomycosis of Rabbit Caused by Aspergillus*.) HERMANN SCHÖPFLER. Centralbl. f. Bakteriologie (etc.), Jena. I. Abt. Orig., 1919, 82, 559-564.

An anatomic pathologic study of a case of aspergillosis in the rabbit caused probably by *Aspergillus fumigatus*.—R. E. B.

177. *Sur les Spirochètes du tube digestif des Rongeurs*. (*The Spirochetes of the Digestive Tube of Rodents*.) P. BEKINSKY. Bull. Soc. Cen. méd. vét., Par., 1918, 94, 296-298.

Spirochetes were found in the mucous membrane of 12.9 per cent of normal rodents examined and of 8.2 per cent of rodents treated with various pathogenic bacteria. A description of the spirochetes is given.—W. G.

178. *Eine infektiösekerato-conjunctivitis bei Gamsen*. (*An Infectious Kerato-conjunctivitis in Chamois*.) STROHI. Deutsche tierärztl. Wochenschr., 1919, 27, 84-87.

Strohi describes a disease affecting the eyes of chamois in the North Tyrol district preserves. The disease attacked animals irrespective of age or sex. Ninety-five per cent of the autopsied cases showed lungworm changes. Secondary pyemic infection was never observed. Tapeworms and *Cysticercus tenincolis* were regularly found. A catarrhal rhinitis was occasionally observed, but this was attributed to heavy lungworm infestation. Otherwise, autopsy findings were negative.—J. T.

179. *Étude d'une infection expérimentale chez Ascidia mentula*. (*Experimental Infection of Ascidia mentula*.) J. CANTACUZÈNE. Compt. rend. Soc. de biol., Par., 1919, 82, 1019.

An organism resembling *B. coli* was isolated from the intestinal tract of *Aplysia punctata*. With this culture numbers of *Ascidia mentula* were inoculated, and the infected animals were sacrificed at daily intervals and examined. The animals rarely succumbed to the infection. Twenty-four hours after the injection bacteria in the general circulation are rare, many are found after 2 days, large numbers after 4 days; and then they begin to disappear until on the 9th day none can be found in a motile state. During the septicemia the bacteria are very motile, with no tendency to agglutination. The rôle of the various elements, cellular and humoral, in effecting cure is discussed.—G. H. S.

180. *Essais de pyothérapie dans les suppurations diverses*. (*A Study of Pyotherapy in Various Suppurations*.) G. A. CHANIER. Rec. de méd. vét., Par., 1918, 94, 403-411.

Tests on autopyotherapy and on monovalent and polyvalent pyotherapy in the treatment of suppurating wounds were made. The various methods gave good results quite uniformly. Pyotherapy should be used in conjunction with surgery. It is considered to act by a stimulation of phagocytosis rather than by conferring immunity. Case reports are given.—W. G.

181. *Pyothérapie*. (*Pyotherapy*.) M. MOUSSU. Bull. Soc. Cen. méd. vét., Par., 1918, 94, 469-481.

There is given a description of the method of preparing the pus (auto-, hetero-, or poly-), its preservation, doses, place of injection and a discussion of the reactions. There are presented case reports showing very favorable results from the treatment which is outlined in detail.—W. G.

## PARASITIC DISEASES

(See also Numbers 90, 164, 177)

183. *Amebic Dysentery in California*. W. W. CORT AND J. D. McDONALD. J. Infect. Dis., Chicago, 1919, 25, 501-508.

Seventeen cases of amebic dysentery were investigated to determine the source of the infection. In 6 of these cases, the evidence showed that the disease was contracted within California by persons who had never been outside of the state. Similar data collected by others show that amebiasis is frequently contracted in California and that carriers occur.

As California receives immigrants from the Orient and tropical countries, where amebic infection is common, and as these persons are usually laborers who work on truck farms and in other phases of food-handling, the state presents many opportunities for the introduction and spread of amebic dysentery.—S.B-J.

183. *The Status of Amebic Dysentery with Special Reference to Diagnosis and Treatment*. RANDOLPH LYONS. South. M. J., Birmingham, 1920, 13, 4-10.

A brief statement as to the recognition of the various amebae, and a detailed statement of the methods employed in the clinical diagnosis and the treatment of amebic infections.—J. H. B.

184. *The Prevalence of Ameba, Cercomonas intestinalis-hominis, and Pellagrous Infections in the South. The Responsibility Resting on Nation and State; Suggestions as to Means of Control*. JOHN L. JELKS. South. M. J., Birmingham, 1920, 13, 23-26.

The author believes that there are endemic foci of amebic, flagellate, and pellagrous infections in the South and insists that definite effort should be made to care for these areas and protect the population. He reports a recent break in a sewer in Memphis followed by a remarkable number of cases of cercomonas infections.—J. H. B.

185. *Les hépatites amibiennes aiguës abortives. (Acute Abortive Amoebic Hepatitis.)* F. FRANGON. Thesis, Univ. Paris, 1919. Presse méd., Par., 1919, 27, 464.

A discussion. Medical treatment with emetin and arsenic preparations sufficed in these cases.—L. A. K.

186. *A New Nematode in Fowls Having a Termite as an Intermediary Host*. ARNOLD THEILER. The Fifth and Sixth Repts. of the Director of Veterinary Research Union of South Africa. Dept. of Agr., Pretoria, 1918, 697-707.

*Filaria gallinarum* (n. sp.) is parasitic in the intestine of fowls where it attains sexual maturity. The larvae parasitize a termite *Hodotermes pretoriensis* in the body of which they undergo one ecdysis. Birds hatched in an incubator and reared under conditions which excluded the possibility of extraneous infections with these nematodes became infected as a result of swallowing termites. Birds which served as controls remained free from the parasites.—B. S.

187. *Une espèce nouvelle d'Anchitrema. (A New Species of Anchitrema.)* L. GEDOELEST. Compt. rend. Soc. de biol., Par., 1919, 82, 1250.

A complete description is given of an intestinal parasite found in *Chamaeleon dilepis*. The form is named *Anchitrema latum* and the points by means of which it can be differentiated from *Anchitrema sanguineum* are given.—G. H. S.

## TROPICAL DISEASES

(See also Number 104)

188. *Etiology of Yellow Fever. IX. Mosquitoes in Relation to Yellow Fever*. HIDEYO NOGUCHI. J. Exper. M., Balt., 1919, 30, 401-410.

Experiments are recorded which show that symptoms and lesions closely resembling those of yellow fever in man can be induced in guinea pigs by the bite of female stegomyias that have previously sucked the blood of a yellow fever patient or of an animal experimentally infected with *Leptospira icteroides*. With mosquitoes infected by biting a yellow fever patient the infectivity seems to become manifest after a longer period of incubation (at least 12 days) than with those infected with animal blood, due to the fact that the number of leptospira existing in experimentally infected guinea pigs is far greater than that in the blood in natural human infections. Mosquitoes engorged with the blood of experimentally infected guinea pigs transmitted the disease within 8 days after feeding.

The percentage of successful transmissions was very small, both from yellow fever patients and from experimental animal infections. It appears that even under natural circumstances the percentage of mosquitoes that eventually become infected with the yellow fever microbe by sucking the blood is very small, and it is those few that do become infected that carry the disease. An emulsion of crushed infected mosquitoes, when rubbed on the scarified skin of a guinea pig, produced the disease more rapidly than the bite of such infected mosquitoes.



*Leptospira icteroides* is indispensably associated with the blood constituent, the serum, which is amply supplied by the blood-sucking insect. They represent one of the most fragile of all the pathogenic parasites, and cannot survive association with other less fastidious organisms, such as bacteria. They are well protected in the comparatively aseptic body cavity of the stegomyia. They are capable of penetrating the intact skin or a bacteria-proof filter. Whether or not they can survive and multiply only in the body of *Stegomyia calopus* and not in other varieties or genera is yet to be determined. They can multiply steadily at a temperature from 18° to 37°C., the optimum temperature, at which they remain viable for many months, being 26°C.—I. W. P.

189. *La cura della malaria cronica e chinino-resistente per mezzo dei raggi X.* (The Cure of Chronic and Quinin-Resistant Malaria by Means of X-Rays.) A. PAIS. Ann. d'ig., Roma, 1919, 29, 359.

Small doses of x-rays attenuate the disease and may stop the febrile manifestations. Different forms of malaria respond to different concentration of rays. The author divides his experiments into two groups: (a) Kind and form of malaria and the periods of infection in which radio-sensitivity is greatest; the necessary doses to obtain therapeutic effects are thus small, and must be carefully graduated, while the proper time for radiation must be accurately established. Very acute and new forms, especially estivo-autumnal come under this type. (b) Forms of infection in which the radio-sensitivity is less and consequently greater doses are tolerated; the proper time is less important. Chronic forms, and quinin-resistant forms come under this heading.

The influence of x-rays on the modification of the thermal curve, hematological forms, splenic tumor, and parasites as well as the technic used are given.—P. M.

190. *Les gangrènes palustres des membres.* (Malarial Gangrene of the Limbs.) H. ALAMARTINE. Presse méd., Par., 1919, 27, 459.

Three cases of endarteritis obliterans in malaria patients. These and similar cases seen in the French army of the orient are ascribed to the malarial parasite.—L. A. K.

191. *Umwandlung der Malariaparasiten oder Mischinfektionen?* (Transformation of the Malarial Parasite or Mixed Infection?) CARLY SEYFARTH. Centralbl. f. Bakteriologie (etc.), Jena. I. Abt. Orig., 1919, 82, 564-570.

A contribution to the unity (Laveran) or multiplicity (Golgi) of species of the malarial parasite. In a study of many thousand cases of malaria extending over a period of 2½ years in southeast Bulgaria, it was noted that each type showed a decided preference for a particular season of the year. The author concludes that those who contend for polymorphism of a single species are in error. There are three distinct types of malarial parasites, although transformation of one type into another type is quite possible, particularly under the influence of the seasons.—R. E. B.

## MEDICAL ENTOMOLOGY

(See also Numbers 188, 360)

192. *Experiments with Steam Disinfectors in Destroying Lice in Clothing.* R. H. HUTCHISON. J. Parasitol., Urbana, Ill., 1919, 6, 65-73.

A series of experiments was undertaken at Camp Mills, Long Island, to determine "whether the disinfecting process in use at these plants was effective in destroying lice in the clothing, and whether the process would still be effective if the time of treatment were shortened—thus increasing the daily capacity of the plants."

The results are summarized as follows: "If the penetration of steam is sufficient to produce a temperature of 75°C. (167°F.) in the center of a barracks bag (or other load of infected goods) all eggs and active stages of body lice will be destroyed."

If the disinfectors are operated efficiently on the time schedule now employed (viz., a 10-inch preliminary vacuum: 15 pounds steam pressure for 15 minutes, reckoned from the time the steam is turned on; followed by a 10-inch drying vacuum) the requisite temperature (75°C.) is attained in every case. By efficient operation is meant (1) the maintenance of a full head of steam so that 15 pounds pressure in the disinfecter is produced within 5 minutes, thus allowing at least 10 minutes for exposure; (2) overloading must be guarded against; (3) the individual bundles must not be rolled too tightly.

Little if any shrinkage of woolen goods is caused by this treatment. There is, of course, some wrinkling, but these wrinkles are not permanent but may be remedied by pressing.—W. A. R.

193. *Delousing. Methods Used by Quarantine Officers of the Public Health Service.* Pub. Health Rep., Wash., 1919, 34, 675-677.

The procedure here described was carried out with success in dealing with the threatened introduction of typhus fever at El Paso in the winter and spring of 1916-17, and is still being employed there. All persons coming to El Paso from Mexico who are considered likely to be vermin infested are sent through a plant for disinfection. Clothing is sterilized in a steam

chamber carriage, where it is held for 10 minutes. Shoes and other articles injured by steam are exposed to cyanogen. The persons are examined for head lice, and if they are found infected, the hair of the men and boys is clipped off and the women have a mixture of equal parts of kerosene and vinegar applied to the head for half an hour, followed by a shampoo of soap and water. A mixture of soap, water and kerosene is sprayed upon the body from an elevated reservoir and the person proceeds to the baths, which are superintended by an attendant. Everyone is vaccinated before leaving the plant.—C. E. T.

194. *Neue Beobachtungen und Versuche über die Lebensfähigkeit der Kleiderläuse und ihre Eier.* (New Observations and Tests on the Viability of the Clothing Louse and Its Eggs.) ALBRECHT HASE. Centralbl. f. Bakteriöl. (etc.), Jena. I. Abt. Orig., 1919, 82, 461-468.

Clothing lice when prevented from feeding die within 10 days at 0° to 6°, within 7 days at 10° to 20°, within 2 days at 25° to 30° and within 1 day at 35° to 37°. Females cannot lay eggs for more than 5 days after the last feeding. The eggs under certain conditions may hatch even after 27 days. The larvae cannot live longer than 7 days without feeding. In order to delouse by starvation a maximum of 39 days is necessary.—R. E. B.

195. *Napthalene vs. Chicken Lice.* W. S. ABBOTT. J. Econom. Entomol. Concord, N. H., 1919, 12, 397-402.

Napthalene is a common ingredient in proprietary lice powders, to the extent of 0.17 to 67 per cent. The tests conducted show that powders containing 5 per cent or less are valueless while those with 10 to 20 per cent are very effective, but may injure temporarily or, if containing 60 per cent, may even kill fowls. Napthalene nest eggs are of no value but on the contrary injure hens, eggs, and possibly any chickens hatched.—W. A. R.

196. *The Depluming Mite of Chickens: its Complete Eradication from a Flock by one Treatment.* H. P. WOOD. J. Econom. Entomol. Concord, N. H., 1919, 12, 402-404.

The depluming mite of fowls seems to be quite generally distributed in the United States. In addition to the very evident damage to plumage, detrimental to show birds, the mite is more injurious than is commonly supposed. Of a number of dips tested, the best results were obtained from a solution of sodium fluoride (chemically pure)  $\frac{1}{2}$  ounce, sulphur, 2 ounces, soap (laundry)  $\frac{1}{2}$  ounce, water, 1 gallon. This eradicated both lice and depluming mites at one treatment.—W. A. R.

197. *A Note on the Flight of Mosquitoes through Horizontal Water Pipes.* W. W. KING. Pub. Health Rep., Wash., 1919, 34, 386-390.

Observations on the water cisterns at a residence in St. Thomas, Virgin Islands, brought to light certain points in the habits of mosquitoes which may have a practical application in the antimosquito work. It was found that mosquitoes entered and left cisterns through unscreened perpendicular waterspouts 2 $\frac{1}{2}$  and 3 inches in diameter and 14 and 10 feet high. Mosquitoes did not enter cisterns through larger unscreened water spouts when these pipes had a horizontal section from 12 to 32 feet long, but when the mosquitoes were bred in the cisterns or septic tank and had no other means of exit they passed through horizontal pipes 4 and 5 inches in diameter for a distance of 191 feet in the longest instance, aided probably to a certain degree by air currents. It was thought that the mosquitoes hatched in the septic tank from larvae deposited in the toilet bowls and flushed through the tank. These mosquitoes were roughly identified as *Culex quinquefasciatus*, with a few white striped mosquitoes, apparently *Aedes*. From these facts it would seem perhaps unnecessary to screen waterspouts and other pipes into cisterns and tanks when such pipes have a considerable horizontal section, unless the mosquitoes are breeding in the tanks from eggs carried from an outside place of deposit.—C. E. T.

198. *The Occurrence of Anopheles punctipennis in Northern New England.* C. T. BRUES. Psyche, Bost., 1919, 26, 143.

Larvae of *A. punctipennis* were collected at Telos Lake, Maine, which is latitude 46° 7' North. This is apparently the most northern record for this species.—W. A. R.

199. *The Domestic Breeding Mosquitoes of the Northern Territories of the Gold Coast.* A. INGRAM. Bull. Entomol. Research, Lond., 1919, 10, 47-58.

In a tour of three months, May 3 to August 2, 1918, effort was made to determine the prevalence of *S. fasciata* and to record the distribution of the other species of mosquitoes and "sandflies" about the native compounds and the rest houses.

Larvae of 6 species of mosquitoes were commonly found, namely: *S. fasciata* T., *S. vittata* Big., *Culicomyia nebulosa* Theo., *Culex duttani* Theo., *C. decens* Theo., and *C. tigripes* var. *fuscus* Theo. Larvae of *A. costalis* Loew, and *C. invidiosus* Theo., were taken but rarely.

Phlebotomus was taken on the walls of most of the rest houses. As pappataci fever has been reported from Nigeria, it is almost certain that it also occurs in the Gold Coast.—W. A. R.

200. *On the Occurrence of Stegomyia fasciata in a Hole in a Beech Tree in Epping Forest.* M. E. MACGREGOR. Bull. Entomol. Research, Lond., 1919, 10, 91.

Two males of *S. fasciata* were bred out from a tank containing mixed larvae from Epping Forest. Though this occurrence of the yellow fever mosquito in nature in England is probably

accounted for by stray individuals which have escaped from laboratories, it is surprising that the first recorded specimens to be found under natural conditions should have occurred in a forest to a large extent removed from human habitation. (It should be noted that brief local outbreaks of yellow fever have occurred in England, thus evidencing that under favorable conditions the mosquitoes have been present in nature.—R.)—W. A. R.

201. *Anopheles und Malaria in Halle. Zugleich ein Beitrag zur Morphologie und Biologie der Larve von Anopheles maculipennis Meigen.* (*Anopheles und malaria in Halle. A Contribution to the Morphology and Biology of the Larva of A. maculipennis Meigen.*) E. TÄNGER AND H. OSTERWALD. Beihefte z. Arch. f. Schiffs- u. Tropenhyg., Leipzig, 1919, 23, 7-48. The establishment in Halle of a military hospital for malaria patients necessitated a study of the natural distribution of *Anopheles* in the environs.

In spite of the fact that Halle lies in latitude 51° 23' the *Anopheles* larvae are exceedingly abundant in the neighborhood. They were always lacking where the water was deeply shaded, never being found in forest pools. Muddy pools were avoided. Small collections of water were especially favored. As for depth, the observations refuted Kerschbaumer's view that *Anopheles* larvae do not develop in bodies of water which average more than 1 m. in depth. In flowing water they were present in bays thickly overgrown with plants.

The larval development required 3 to 4 weeks, depending upon the temperature, while the complete life cycle extended over 6 to 8 weeks. Important morphological data are presented and illustrated by text figures.

Malaria was once prevalent in Halle and its environs but gradually disappeared until in 1913 Grund could say that the city was notoriously free from the disease. Since the outbreak of the war several cases have occurred and the present studies have shown that conditions are favorable for its spread, unless active measures against it are taken. The importance of careful surveys and energetic campaigns against the *Anopheles* are emphasized.—W. A. R.

202. *The Early Stages of West African Mosquitoes.*—IV. A. INGRAM AND J. W. S. MACFIE. Bull. Entomol. Research, Lond., 1919, 10, 59-69.

A continuation of studies previously published in this Bulletin. The species now reported on are *Anopheles pretoriensis* Theo., *A. rufipes* Gough, *Ochlerotatus hirsutus* Theo., *O. nigeriensis* Theo., *Culex ager* Giles, *C. quasigehidus* Theo., and *C. Univittatus* Theo.—W. A. R.

203. *Culicides dans les Ardennes.* (*Culicides in the Ardennes.*) G. PÉJU. Compt. rend. Soc. de biol., Par., 1919, 82, 1267.

The anophelines represent 8 to 9 per cent of the mosquitoes.—G. H. S.

204. *An Enquiry into the Relations of Glossina morsitans and Ungulate Game, with special Reference to Rinderpest.* H. L. DUXE. Bull. Entomol. Research, Lond., 1919, 10, 7-20.

A study was undertaken in the Uganda Protectorate to determine the correctness of a common opinion that rinderpest epidemics result in marked decrease of the tsetse flies.

The author finds that the rinderpest blood has no apparent effect on the fly, either by direct poisoning or by development of the rinderpest organism taken up by the fly. In general his conclusion, though not final, is that the fly cannot exist in an area where game is entirely and permanently absent, and that in the notable rinderpest epidemic of the nineties the passage of the disease through the fly country was marked by a great diminution in the numbers of the tsetse.—W. A. R.

205. *Tsetse Fly in Southern Rhodesia, 1918.* R. W. JACK. Bull. Entomol. Research, Lond., 1919, 10, 71-90.

The history of the tsetse-fly in S. Rhodesia up to the present (1918) continues to be one of expansion. Since detailed reports of the advance on retrogression of *Glossina morsitans* in other parts of Africa appear to be lacking the careful studies here presented will be of general interest.—W. A. R.

206. *The Prevalence of Phormia azurea Fallen (Larva Parasitic on Nestling Birds), in the Puget Sound Region and Data on Two Undescribed Flies of Similar Habit.* O. E. PLATH. Ann. Entomol. Soc. Amer., Columbus, O., 1919, 12, 373-381.

While the blood sucking habit has been supposed to be very rare among the larvae of *Diptera*, a number of workers have called attention to the fact that several species of flies, during their larval stage attack birds. The writer reports examination of 54 nests containing nestlings of 10 different species of birds in the Puget Sound region. Of these, 61 per cent contained the larvae of *Phormia azurea*.

Two other species collected proved to be new, one of which is described by Townsend as *Phormia metallica*, while the second is described by Aldrich as *Hylemyia nidicola*.—W. A. R.

207. *Un Oxyuridé nouveau parasite d'un reptile.* (*A New Oxyuride Parasitic in a Reptile.*) L. GEDOELST. Compt. rend. Soc. de biol., Par., 1919, 82, 910.

The parasite which is described was found in the intestinal tract of *Sceloporus undulatus*. The parasite is described in detail, and is named *Cryptosomum scelopori*.—G. H. S.

## EPIDEMIOLOGY

(See also Number 331)

- #108. *Contamination of the Hands and Other Objects in the Spread of Diphtheria.* GEORGE H. WEAVER AND JOHN T. MURCHIE. J. Am. M. Ass., Chicago, 1919, 73, 1921.

Cultures were made to determine whether the hands of nurses and internes were free from diphtheria bacilli and hemolytic streptococci which they had acquired in handling patients after the washing with soap and running water which have been depended upon for cleaning the hands. Cultures were also made from door knobs after they had been unwashed for several hours. The observations were carried over a period of 5 months. A total of 268 examinations were made, from 1 to 15 being made on the same individual. Of cultures made from beneath the finger nail and from palmar surfaces, 9.3 per cent showed the presence of hemolyzing streptococci and 3 per cent of diphtheria bacilli. Of 45 nurses 35.6 per cent yielded hemolyzing streptococci and 13.3 per cent diphtheria bacilli. No individual who had 10 or more cultures failed to show hemolyzing streptococci. Of examinations made from nurses trained in the care of contagious diseases 2 per cent showed the presence of hemolyzing streptococci and no diphtheria bacilli. From internes 15.6 per cent yielded hemolyzing streptococci and 6.7 per cent diphtheria bacilli. The experiments show that washing with soap and running hot water does not always rid the hands of infectious material. The results from the trained nurses show however that it can be done. Since examinations of door knobs showed the presence of hemolyzing streptococci in 5.8 per cent of the cases and of diphtheria bacilli in 4.4 per cent. It is clear that door knobs may be a means of infection. Special instruction should be given in the care and cleansing of hands. In caring for patients when gross contamination of the hands cannot be avoided some mechanical means of protection are suggested such as rubber gloves. Doors should be constructed to avoid the necessity of door knobs.—P. G. H.

- #109. *Two Instructive Outbreaks of Typhoid Fever.* GUSTAV F. RUEDIGER. J. Infect. Dis., Chicago, 1919, 25, 306-310.

Two outbreaks of typhoid are recorded from two California towns, one being traced to an ill-protected well and the other to a milk supply contaminated by a dairy helper lately convalescent from typhoid.—I. W. P.

- #110. *Some Problems in the Control of the Acute Infectious Diseases in the Army.* FREDERICK F. RUSSELL. South. M. J., Birmingham, 1920, 13, 29-36.

A discussion of the incidence in the army of intestinal infections, with especial reference to typhoid, as it occurred in the vaccinated troops; epidemic meningitis with a brief statement as to the frequency of healthy carriers and their treatment: a brief statistical statement concerning influenza.—J. H. B.

- #111. *A Sanitary Social Service Based on Experience with the Bureau of Venereal Diseases.* MILTON BOARD. South. M. J., Birmingham, 1920, 13, 37-39.

A brief statement of the Kentucky organization in its efforts directed toward the treatment of venereal diseases, the education of the public, and the securing of legislation and law enforcement.—J. H. B.

- #112. *Role of the Public Health Nurse in Control of Venereal Diseases.* JOSEPH S. LAWRENCE. Health News, Albany, 1919, 14, 285-289.

A general discussion.—F. W. T.

## SANITARY ENGINEERING

- #113. *Sand Filter.* HENRIK PRINTZ. Tidskrift Kemi, 1919, 16, 141-147.

"The city water supply with a bacterial count of from 80 to 700 colonies per cubic centimeter was filtered through 125 cm. of sand. The filtering tank was 68 cm. in diameter. It was constructed of wood with a concave bottom. The water-flow was regulated to 15 liters per hour and was evenly distributed over the surface by means of a water wheel. The sand was from the Stockholm filter beds and the water that first passed through it gave a count of 210 colonies per cubic centimeter. After having been treated with  $H_2O_2$  and washed the count dropped to 75, 49 and 29 colonies per cubic centimeter. After 5 months' operation the top 10 cm. of sand was removed and washed. This treatment caused an increase in the count from 18 to 45 colonies per cubic centimeter. The sand was not disturbed thereafter. The maximum count of the bacteria in the filtered water for the last 2 years was 22 colonies per cubic centimeter. During this same period the maximum for the tap water was 350 and the average count for the entire 2 years for the filtered water was less than 12 colonies per cubic centimeter. The organic matter dissolved in the tap water was reduced one-fourth by passing through the filter. Very few organisms could be detected below a depth of 5 cm. and none were found at the 10 cm. level. The action of the filter is selective. The most common organism in the tap water is *B. fluorescens liquefaciens* but in the water that had passed through the filter the non-liquefying *B. fluorescens* predominated" (Chem. Abstr.).—G. H. S.

## DISINFECTION AND GROWTH INHIBITION

(See also Number 345)

214. *The Disinfectant Action of Glycerol in Varying Concentrations.* C.-E. A. WINSLOW AND D. F. HOLLAND. *Proc. Soc. Exper. Biol. & Med.*, N. Y., 1919, 16, 90-92.

The authors carried out carefully controlled tests upon the disinfecting powers of glycerol, using as a test organism young cultures of *B. coli*. From the average results of 23 different series of tests they reached the following conclusions: "1. Glycerol in 9 per cent solution exerts no appreciable effect upon the viability of *B. coli*. 2. Glycerol in solutions of strengths between 28 per cent and 100 per cent exerts a distinct disinfectant action, the effect increasing progressively with increase in the concentration, a 100 per cent solution of glycerol causing the destruction of nine-tenths of the bacteria present in three hours."—L. W. F.

215. *Action de l'éther sur certains microbes pathogènes ou non pathogènes pour l'homme. (The Action of Ether on Bacteria, Pathogenic and Non-pathogenic for Man.)* A. ROUQUIER AND RAOUL TRICOIRE. *Compt. rend. Soc. de biol. Par.*, 1919, 82, 1160.

The use of ether for killing vaccines has made it advisable to study the action of this chemical on a variety of organisms. Emulsions of bacteria (500 million to 1000 million per cubic centimeter) were mixed with one-fifth of their volume of ether, tightly corked, shaken, and frequent subcultures made. Experiments were made at laboratory temperatures. The results are tabulated as follows:

Organism	Killed after contact with ether for
<i>B. pyocyaneus</i> . . . . .	15 minutes
<i>B. proteus</i> X-19 . . . . .	15 minutes
<i>B. dysenteriae</i> Shiga . . . . .	15 minutes
<i>Meningococcus</i> . . . . .	15 minutes
<i>M. prodigiosus</i> . . . . .	1 hour
<i>B. dysenteriae</i> Flexner . . . . .	1 hour
<i>B. diphtheriae</i> . . . . .	4 hours
<i>Pneumobacillus</i> . . . . .	5 hours
<i>B. dysenteriae</i> Strong . . . . .	7 hours
<i>B. dysenteriae</i> Hiss . . . . .	17 hours
<i>B. fecalis alcaligenes</i> . . . . .	17 hours
<i>Streptococci</i> . . . . .	3 days
<i>B. coli</i> (from water) . . . . .	3 days
<i>B. coli</i> (from feces) . . . . .	7 days
<i>Staphylococcus</i> . . . . .	8 days
<i>Enterococcus</i> (from feces) . . . . .	15 days
<i>Pneumococcus Anaerobes</i> (I, II, III, IV) . . . . .	Not killed after 10 days
<i>V. septique</i> . . . . .	Not killed after 8 days
<i>B. edematiens</i> . . . . .	Not killed after 8 days
<i>B. perfringens</i> . . . . .	Not killed after 8 days
<i>B. putrificus</i> . . . . .	Not killed after 8 days

—G. H. S.

216. *A propos de l'action antiseptique de l'éther. (The Antiseptic Action of Ether.)* A. SOULIGOUX. *Compt. rend. Soc. de biol. Par.*, 1919, 82, 1257.

The use of ether for surgical antiseptics is discussed.—G. H. S.

217. *Action des sels de terres rares sur les bacilles dysentériques. (Action of the Salts of the Rare Earths on Dysentery Bacilli.)* ALBERT FROUIN AND ALEXIS MOUSSALI. *Compt. rend. Soc. de biol. Par.*, 1919, 82, 973.

A study of the action of the sulfates of thorium, erbium, lanthanum, and yttrium on *B. dysenteriae*. These salts in concentrations of 1:1000 to 1:5000 inhibit growth. The sulfates of erbium, lanthanum, and yttrium agglutinate Flexner and Shiga strains on concentrations of 1:1000 in 2 hours; in 1:20,000 in 24 hours. Thorium is less active. The bactericidal action of erbium, lanthanum and yttrium is weak; 48 hours' contact with a 2 per cent solution failing to kill. Thorium is more active; contact for 30 minutes in 1 per cent solution killing *B. dysenteriae*. Animals were injected with emulsions of *B. dysenteriae* after contact with the sulfates of these elements, and highly potent agglutinating sera were secured.—G. H. S.

218. *Vergleichende Untersuchungen neuerer Ersatzpräparate für Kresolseifenlösung. (Comparative Tests of New Substitutes for Cresol Soap.)* FRITZ DITTHORN. *Centralbl. f. Bakteriologie* (etc.), Jena. I. Abt. Orig., 1919, 82, 477-483.

A comparative study of five proprietary cresol disinfectants.—R. E. B.

219. *Ueber den Desinfektionswert der drei Kresolisomeren (Meta-, Ortho- und Parakresol). (The Disinfecting Value of the Three Cresol Isomers (Meta, Ortho and Para).)* FRITZ DITTHORN. *Centralbl. f. Bakteriologie* (etc.), Jena. I. Abt. Orig., 1919, 82, 483-491.

A review of the literature is given. The three cresols were tested by suspending the growth from a slant agar culture in 4 cc. of physiological salt solution, broth or ascites fluid.

An equal amount of a double strength solution of the cresol to be tested was mixed, and after varying lengths of time transfers were made to agar and to broth. In general the meta-cresol has slightly the highest disinfecting value, followed in turn by ortho and paracresol.—R. E. B.

**220. Absolute and Relative Disinfection Power of Elements and Chemical Compounds.** H. FRIEDENTHAL. *Biochem. Ztschr.*, Berl., 1919, 94, 47-68.

A comparison of the antiseptic powers of various substances and a correlation with the ionic groups concerned. For comparison the author takes the amount of culture media which can be kept sterile by 1 gram of each antiseptic. There is no ion of such powerful antiseptic virtue as  $H^+$ , of which 1 gram is computed to be capable of maintaining sterility in 30,000,000 liters of culture medium. (Chem. Abstr.)—G. H. S.

**221. Azione antibatterica dei raggi secondari. (Antibacterial Action of Secondary Rays.)** F. GHILLARDUCCI. *Polielin.*, Roma, 1919, 26, 897.

The activity of secondary rays is well manifested by the retardation or lack of development of bacteria. The results invite further study in the unexplored region of radio-biology.—P. M.

**222. The Germicidal Activity of the Eucalyptus Oils.** R. GRIEG-SMITH. *Proc. Linnean Soc. New South Wales*, 1919, 44, 72-92.

The bactericidal action of the eucalyptus oils in olive oil at 20° was proportional to the acidity of the oils when tested against *Micrococcus aureus*. The effect was not caused by acidity but was aided by it. The same action was evident with *B. coli communis*. Here the action of the acid was less marked. The starch-iodide reaction did not indicate the germicidal action of the oils. The vapors of the oils possessed marked bactericidal action. (Chem. Abstr.)—G. H. S.

**223. The Efficiency of Room Disinfection with Formaldehyde.** KARL SÜPFLE. *Arch. Hyg.*, 1918, 87, 235-245.

The amount of formaldehyde and the time of application depend upon the organism which is to be killed. Fifteen grams of formaldehyde per cubic meter acting for 7 hours are necessary to kill anthrax spores. It requires 7.5 grams per cubic meter to kill *Bact. diphtheriae* in 3½ hours. (Chem. Abstr.)—G. H. S.

## WATER AND SEWAGE BACTERIOLOGY

(See also Number 265)

**224. Zur Lebensdauer der Choleravibrionen. (Longevity of the Cholera Vibrio.)** L. GÖZONY. *Centralbl. f. Bakteriol. (etc.)*, Jena. I. Abt. Orig., 1919, 82, 421-425.

Cholera vibrios remained alive for 5 years in a solution of peptone in Danube water, without permanent modification of their characteristics.—R. E. B.

**225. Methods of Water Analysis.** ATILIO A. BADO, V. J. BERNAOLA, A. F. MAZZA AND L. DASSO. *Obras san. de la nac.*, Buenos Aires, 1918, 98 pp.

A monograph giving detailed accounts of the chemical and microbiological methods in use in the Lab. de Analisis de Aguas y Ensayos de Materiales. (Chem. Abstr.)—G. H. S.

**226. An Epidemic of Water-Borne Dysentery.** GEORGE E. STOOKEY. *J. Infect. Dis.*, Chicago, 1919, 25, 331-334.

A report is made of an epidemic of dysentery occurring in the summer of 1918 in a small French town. In addition to a number of natives, several French and American soldiers quartered in the district were attacked. The death rate among the natives was 33 per cent, no deaths occurring among the soldiers. The organism isolated was *B. dysenteriae* Flexner and the source of contamination was found to be a broken water pipe near a latrine.—I. W. P.

**227. Field Methods for the Chlorination of Small Amounts of Water.** F. R. GEORGIA. *J. Am. Water Works Ass.*, 1919, 6, 654-663.

The author describes the effort of the First Depot Division of the A. E. F. to secure a safe drinking water supply. In the area occupied by this division the water was furnished by wells dug in chalk many of which were improperly protected from pollution. To supply a clean and safe water some sort of continuous treatment was found necessary. A home made device for chlorination was devised. An illustration of this apparatus accompanies the paper as well as some of the bacteriological data.—F. W. T.

228. *Keeping the First Army Supplied with Water.* F. W. SCHEIDENHELM. J. Am. Water Works Ass., 1919, 6, 623-638.

A description of the effort to supply water to the First Army. The paper is accompanied by a number of illustrations one of which shows the organization of the Water Supply Service of an army. The discussion presents the different problems of water supply in relation to attack and the methods which were used in solving them.—F. W. T.

229. *Water Supply and Sewage Disposal at the Military Aviation Fields, Posts, Depots, etc., in the United States.* R. H. CRAIG. J. Am. Water Works Ass., 1919, 6, 664-678.

A detailed discussion of the factors mentioned in the title. The different aviation fields are listed.—F. W. T.

230. *The Chloramine Process as Applied to the Catskill (Esopus) Water.* J. Am. Water Works Ass., 1919, 6, 804-832.

The author reports the addition of bleach to the Esopus water which was followed by a destruction of trout. On account of this a study was made of the chloramine process as described by Race. This would allow the amount of bleach to be reduced to an amount where it might not affect the fish. The chloramine process consists in adding ammonia to the bleach just before it is applied to the water. The ammonia and bleach react to give chloramine ( $2\text{NH}_2\text{Cl}$ ). The author reports good removal of *B. coli* with very small amounts of chlorine. The details are presented in the paper.—F. W. T.

231. *Electrical Treatment of Sewage: the Landreth Direct-Oxidation Process.* H. J. M. CREIGHTON AND BENJ. FRANKLIN. J. Franklin Inst., 1919, 188, 157-187.

Methods for the electrical purification of sewage are reviewed. A detailed description of the Landreth direct-oxidation process with the results is given. (Chem. Abstr.)—G. H. S.

232. *Stream Pollution.* H. B. WARD. J. Am. Water Works Ass., 1919, 6, 823-831.

A general discussion.—F. W. T.

233. *Experimentelle Untersuchungen über die Virulenz pathogener Keime im Dünger.* (Experimental Studies on the Virulence of Pathogenic Germs in Dung.) JOSEF ČAMEK. Centralbl. f. Bakteriöl. (etc.), Jena. I. Abt. Orig., 1919, 82, 470-474.

Anthrax, tetanus and blackleg bacilli in manure remain alive and virulent more than 6 months, fowl cholera more than 6 weeks, swine plague 4 weeks, horse influenza 10 to 15 days, streptococci 4 to 7 days, and staphylococci 10 days.—R. E. B.

## FOOD BACTERIOLOGY

(See also Number 274)

234. *Serologic Method for Detecting Infection in Foods.* J. BRONFENBRENNER AND M. J. SCHLESINGER. Proc. Soc. Exper. Biol. and Med., 1919, 17, 24-25.

Owing to the difficulty experienced in the isolation and identification of the infecting organism in contaminated foods, the authors report a procedure by which the suspected food can be analyzed advantageously for any suspected organism, or its split products. The procedure is as follows: "The whole of the sample of food is chopped up and an extract made from it. This extract is concentrated so that all the specific bacterial protein is collected in a very small volume of liquid. This concentrated solution is then tested against a set of specific immune sera." A collection of high titer specific sera must be kept on hand. The presence of a suspected organism in contaminated food may be determined within 24 hours by this method.—L. W. F.

## HEALTH BOARD LABORATORY METHODS

235. *Detection of Diphtheria Bacilli in Swabs by Means of Fluid Serum.* CHING YIP WANG. J. Path. & Bacteriol., 1919, 22, 229-234.

Preparation of fluid serum medium: Ox serum is used. About 2.5 cc. of serum is put in ordinary culture tubes and heated at 56°C. for three hours on three or more consecutive days, the serum evaporating to a syrupy consistency. The fluid medium is inoculated by allowing the swab to be examined to stand in the medium during incubation, usually over night. A thick film of the culture is now made and stained with Neisser's blue and counter-stained with Bismark brown, or Löffler's methylene blue is used, and a microscopic examination is made. Of 250 specimens examined, about 25 per cent more positives were found with the fluid medium than with Löffler's serum medium.—C. G. B.

236. *Le diagnostic rapide du bacilli diphthérique dans les angines et chez les porteurs de germes. (Valeur des granulations polaires de Babés.) (The Rapid Diagnosis of Diphtheria Bacilli from Anginas, and Carriers. (Value of the Polar Granules of Babés.))* ROBERT DEBRÉ AND RAYMOND LETULLÉ. Presse méd., Par., 1919, 27, 515.

Neisser's stain gives positive results with all true diphtheria bacilli. Of the diphtheroids, *B. cutis commune* is the only one showing polar granules. It may be differentiated by its sucrose fermentation. In 800 examinations it was not found in the pharynx. Organisms which do not show polar granules are of no significance in diagnosis or epidemiology.—L. A. K.

237. *Züchtungsbedingungen des Shiga-Kruseschen Dysenteriebazillus und Brauchbarkeit des Endoschen Nährbodens. (Cultural characteristics of the Shiga-Kruse Dysentery Bacilli and the Usefulness of the Endo Medium.)* HEINRICH EGYEDI. Centralbl. f. Bakteriologie (etc.), Jena. I. Abt. Orig., 1919, 82, 454-456.

The addition of 2 per cent of a 10 per cent soda solution to neutral agar, or 1 per cent of a 10 per cent soda to Endo partially inhibits the growth of Shiga-Kruse strains of dysentery bacilli, materially decreasing the size of the colony, but not the Ty, Y, and Flexner strains studied.—R. E. E.

238. *Ist die Grünplatte zur Stuhluntersuchung im Feldmassenbetriebe nötig? (Is the Green Plate Necessary in Field Work?)* M. NEISSER. Centralbl. f. Bakteriologie (etc.), Jena. I. Abt. Orig., 1919, 82, 491-493.

It is contended that the malachite green plate is unnecessary in mass diagnosis if proper technic is used with the Endo plate. Of 1853 samples tested with 142 positive findings, in one case only were there positive results on malachite green and negative on Endo.—R. E. B.

239. *Ein Hilfsmittel zur bakteriologischen Untersuchungen proteus-haltigen Materials (Leichenorgane, Eiter, Stuhl). (An Aid to the Bacteriological Investigation of Proteus-containing Materials (Organs at Autopsy, Pus, Stools.))* H. SCHAEFFER. Berl. klin. Wochenschr., 1919, No. 5; Schweiz. med. Wochenschr., 1920, 1, 37.

Isolated colonies of *B. proteus* can be secured if 2 cc. of a 5 per cent solution of phenol are added to the agar or Endo agar (10 cc.) used for plating. The medium is of use in isolating *B. typhosus*, *B. paratyphosus* B, *B. anthracis*, staphylococci and streptococci.—G. H. S.

## DIATHETIC AND DEFICIENCY DISEASES

240. *On Experimental Scurvy: The Possibility of a Sterilization at High Temperatures without Altering the Alimentary Value of the Sterilized Substances.* G. ROSSI. Arch. di fisiol., Firenze, 1918, 16, 125-133.

Young guinea pigs nourished with small quantities of oats and fresh hay, sterilized in the autoclave at 126°C., die of scurvy in a little more than 20 days, provided the materials have been sterilized in open containers. If the same materials, sterilized in closed, hermetically sealed, containers, are fed to similar animals no effect is to be noted until after 2 months feeding. (Physiol. Abstr.)—G. H. S.

241. *Epidemic Scurvy.* A. BENOIT. Paris méd., 1919, 9, 469.

Severe scurvy affected suddenly and simultaneously 63 men in a group of 350. The condition reached its height on the second day and as suddenly subsided, regardless of treatment or lack of treatment. (Physiol. Abstr.)—G. H. S.



243. *The Antiscorbutic Value of Dry and Germinated Seeds.* H. CHICK AND E. M. DELF. *Bio-chem. J., Liverp.*, 1919, 13, 199-218.

The results of Furst (*Ztschr. f. Hyg.*, 1912, 72, 121) are confirmed. The value of the germinated seeds as antiscorbutics is compared with other foodstuffs used for that purpose. (*Physiol. Abstr.*)—G. H. S.

## CANCER RESEARCH

(See also Numbers 134, 398)

243. *Further Investigations on the Origin of Tumors in Mice. VI. Internal Secretion as a Factor in the Origin of Tumors.* LEO LOEB. *J. Med. Research, Bost.*, 1919, 40, 477-496.

A hormone given off by the ovary regulates those tissue changes which lead to the development of cancer of the breast in mice. The influence of this hormone is a quantitatively graded one.

The effect of hormones on the development of cancer is specific; a hormone influences the development of cancer only in those organs to which under normal conditions it has a specific relation.

In certain cases at least internal secretion does exert an influence on the growth of adenomata, but it is without noticeable effect on the growth of carcinomata after they have been established. On the other hand, internal secretion has been proven to have a definite effect on those tissue changes which lead to the development of cancer, and a prevention of the effect of this internal secretion at a sufficiently early period of life may prevent the development of cancer, while the elimination of such an internal secretion cannot possibly exert any marked effect on the growth of cancers after they have once developed, at least in the large majority of cases.—A. C. E.

244. *The Growth of Tissues in the Test Tube under Experimentally Varied Conditions with Special Reference to Mitotic Cell Proliferation.* LEO LOEB AND MOYER S. FLEISHER. *J. Med. Research, Bost.*, 1919, 40, 509-550.

Pieces of organs growing in culture media in the test tube undergo changes which in all essential respects are comparable to those observed after transplantation into the subcutaneous tissue. Certain exceptions, however, exist, especially in the case of those organs which have the power to liquefy the coagulum.

Mitotic proliferation is often very extensive *in vitro*; it not only occurs in fibroblasts but in various kinds of parenchyma, and especially in those cells which are able to proliferate after subcutaneous transplantation. There exist some differences between the mitotic proliferation of epithelium and of connective tissue. On the whole, the parenchymatous mitotic proliferation is much more regular than that of the fibroblasts, and the sum of epithelial mitoses exceeds considerably that of the fibroblastic mitoses.

The same primary stimulus causes in cells migration and mitotic cell proliferation, but according to the differences in the structure of cells the same stimulus may call forth more readily the first of these two responses in one kind of cells and the second in the other kinds of cells.

It is very probable that introduction of pure oxygen may increase the zone of living tissue and the mitotic activity especially of the parenchyma under conditions in which there had been a deficiency in oxygen. Tissues may show a marked mitotic cell proliferation, if they are kept in liquid blood serum; in this case the proliferation is mainly parenchymatous.—A. C. E.

245. *The Lymphocyte in Natural and Induced Resistance to Transplanted Cancer. V. Histological Study of the Lymphoid Tissue of Mice with Induced Immunity to Transplanted Cancer.*—J. B. MURPHY AND W. NAKAHARA. *J. Exper. M., Balt.*, 1920, 31, 1.

A careful study of the spleen, lymph glands, circulating lymphocytes and subcutaneous connective tissue in mice immunized against cancer by means of a subcutaneous injection of defibrinated normal mouse blood showed in the germinal centres of the lymphoid organs a marked increase in the number of mitotic figures, and in the circulating lymphocytes frequent amitotic division and many examples of irregular and lobulated nuclei.

Three immunized animals when inoculated with a cancer graft 10 days after the injection, showed a second stimulation of the lymphoid centers similar to the first but more intense, becoming evident as early as 24 hours and persisting in a marked degree for a week.

No cellular changes were noted in the bone marrow, thymus or thyroid gland, liver or kidneys of these mice.

Apparently the immunized animals possessed hypertrophic lymphoid elements, although not reflected in the blood counts, and the lymphoid mechanism had become so sensitized that a very small amount of cancer tissue was sufficient for the lymphocytosis in immunized mice after implantation of the tumor tissue.—W. P. B.

246. *Studies on X-Ray Effects. V. Effect of Small Doses of X-Rays of Low Penetration on the Lymphoid Tissue of Mice.* W. NAKAHARA AND J. B. MURPHY. J. Exper. M., Balt., 1920, 31, 13.

Stimulation of the lymphoid tissue in mice, as evidenced by an unusually large number of mitotic figures in the lymphoid tissue of the spleen and lymph glands, was repeatedly obtained by exposure to the following dose of x-rays: spark gap  $\frac{1}{2}$  inch between points, milliamperage 25, distance from target to back of animal approximately 8 inches, time 20 minutes.—W. P. B.

247. *Histological Changes in Squamous Cell Carcinoma of the Cervix of the Uterus after Radiation.* NICHOLAS M. ALTER. J. Med. Research, Bost., 1919, 40, 241-264.

This paper is the first of a series of papers dealing with the tissue changes in the different types of growth after radiation. For the work reported in this paper 275 specimens were available. The conclusions are as follows:

"The so-called 'squamous' cell carcinoma of the cervix is a basal-cell growth, having three types—solid, adenoid and cystic. The primary effect of the rays of radium in the case of the basal-cell carcinoma of the cervix is the destruction of the cells of the malignant parenchyma. The increase of stroma is secondary, due to the disappearance of the parenchyma, having been formed mostly from wandering cells. Cell divisions, even if probable, are not primarily important.

"In our long series of histological observations, invariably the chromatin substance of the parenchyma cells displayed the greatest sensitiveness towards the rays of radium, showing conspicuous features of destruction. The protoplasm of the parenchyma cells shows marked but not such obvious changes. The changes of the protoplasm and the nature of the infiltration seem to suggest the different stages of deep-seated chemical changes, due to the action of the rays of radium."—A. C. E.

248. *Primary Lymphoblastoma of the Intestine. Report of Three Cases, One with Apparent Recovery Following Operation. A Plea for a Logical Classification of Tumors.* STUART GRAVES. J. Med. Research, Bost., 1919, 40, 415-431.

Records of about 246 cases of lymphoblastoma of the intestine were collected in an extensive search of the literature.

A description of 3 new cases is added. In one of these cases the patient is in good health approximately three years after operation.

The disease occurs anywhere from 1 to 80 years of age, but is most frequent in the third and fourth decades.

A reliable comprehension of the nature of tumors and their clinical significance, as well as accurate statistics in regard to them, cannot be available so long as they are designated by such incorrect nomenclature.—A. C. E.

249. *Report of Three Cases of Combined Tumors of the Kidney in Adults.* FRANK B. BERRY. J. Med. Research, Bost., 1919, 40, 459-469.

Combined tumors are rare. Of the three described in this paper, the first is a hypernephroma or adrenal cell carcinoma and fibrosarcoma of the kidney; the second a papillary adeno-carcinoma and fibrosarcoma also of the kidney; and the third an adrenal cell carcinoma and leiomyosarcoma.

It is not possible to determine exactly the origin of these tumors, but the author regards them all as cases of true combination of two tumors; epithelial and connective tissue.—A. C. E.

## DISEASES OF THE BLOOD, LYMPHATICS AND DUCTLESS GLANDS

(See also Numbers 191, 401, 420, 463)

250. *Les notions actuelles sur le typhus exanthématique. Étude de deux épidémies. (1916) Épidémie serbe de Bizerte; (1917) épidémie roumaine de Moldavie. Démonstration du rôle exclusive du pou dans la transmission de la maladie. (Present Ideas on Typhus Fever. A Study of Two Epidemics: The Serbian Epidemic of Bizerte of 1916; the Roumanian Epidemic of Moldavia, 1917. The Exclusive Role of the Louse in the Transmission of the Disease.)* FÉLIX GÉRARD. Thesis, Univ. Paris, 1918-19. Presse méd., Par., 1919, 27, 411.

A general discussion. Nonspecific sero-diagnosis is useless, the only diagnostic method of value is transmission to the guinea pig. The probable etiological agent is a filterable virus. The exclusive rôle of the body louse in transmission is reasserted.—L. A. K.

251. *Ricerche sul liquido cefalo rachidiano nella febbre petechiale. (Researches on Cerebrospinal Fluid in Typhus Fever.)* R. MONTELEONE. Policlin., Roma, 1919, 26, 1009.

Valuable information may be obtained in the diagnosis of typhus fever from examination of the cerebrospinal fluid. The following facts are revealed: (1) hypertension of liquid; (2) excess of albumin; (3) Nonne's reaction—the presence of globulin.—P. M.

252. *Les complications nerveuses du typhus exanthématique. (The Nervous Complications of Typhus Fever.)* DÉMÉTRE-EM. PAULIAN (BUCAREST). Presse méd., Par., 1919, 27, 541.  
A résumé of the clinical and pathological neurology complicating typhus fever.—L. A. K.

253. *Ueber die Bedeutung der Proteus-Bacillen beim Fleckfieber. (The Significance of the Proteus Bacillus in Typhus Fever.)* JOHANNES SCHÜRER AND GEORG WOLFF. Centralbl. f. Bakteriöl. (etc.), Jena. I. Abt. Orig., 1919, 82, 517-528.

A bacteriological study of the blood of 260 typhus patients showed *Proteus* bacilli of types X19 and X2, as also common saprophytic types. The Weil-Felix agglutination reaction is to be regarded as the expression of a *Proteus* mixed infection. In typhus the saprophytic *Proteus* bacilli present in the intestine pass into a kind of symbiosis with the typhus virus. There are no cultural or morphological differences between the common *Proteus* bacilli and the X types. Transition forms between the common types and X2 type are found. *Proteus* X19 is on the other hand differentiable by its high agglutinability. Among 72 strains from stools and urine of non-typhus patients, none was found that would agglutinate in a dilution of typhus blood higher than 1:100.—R. E. B.

254. *Beitrag zur Bakteriologie der Recurrensspirochäte, zugleich ein Beitrag zur Wirkung des Neosalvarsans auf Rückfallfieberkranke. (Contribution to the Bacteriology of the Spirochete of Recurrent Fever, also a Contribution to the Action of Neosalvarsan on Recurrent Fever.)* STEFAN STERLING-OKUNIEWSKI. Centralbl. f. Bakteriöl. (etc.), Jena. I. Abt. Orig., 1919, 82, 456-460.

A record of observations of about 350 cases of relapsing fever at Lodz. The morphology of the spirochete varied with different individuals in the length, thickness and number of spirals. The numbers visible in a microscopic field varied from tangled masses to one or two or even rare. Multiplication was usually by transverse fission, though longitudinal division also occurred. Culture failed.

A report is given of the effect of neosalvarsan in several series. In general this led to a prompt return to normal temperature and the disappearance of the spirochete.—R. E. B.

255. *Weitere histologisch-bakteriologische Befunde beim Fleckfieber. Zweite Mitteilung: die Bedeutung der Rickettsia Prowazeki für die Entstehung des Gefäßknötchens. (Further Histologic and Bacteriologic Findings in Typhus Fever. II. The Significance of Rickettsia Prowazeki in the Origin of Vascular Nodules.)* KUCZYNSKI. Zentralbl. f. Path., 1919, 30, No. 2.

Lesions were found in the nervous system of guinea pigs infected with typhus fever. These lesions were ascribed to the presence of *Rickettsia* which caused necrotic foci in the endothelial cells. Thus, this parasite is considered as the cause of typhus fever, while *proteus* X-19 appears to play no rôle, at least in the infection in guinea pigs. (Cor.-bl. f. schweis. Aerzte.)—G. H. S.

256. *The Leucocytes in Trench Fever and Allied Obscure Pyrexias.* W. K. INGLES. Med. J. Australia, Sydney, 1919, 6th year, 2, 431-435; 454-462.

The differential diagnosis and the clinical findings as given by various investigators, are discussed at considerable length. The author's conclusions are:

1. In trench fever there is typically a definite, but variable leucocytosis.
2. There is an absolute increase in both polymorphonuclear and non-granular cells.
3. The increase of the non-granular cells is relatively greater than the increase of the polymorphonuclear cells.

4. The blood picture may in some cases be of definite help in arriving at a differential diagnosis. The leucocytosis helps to exclude enteric fever and the high non-granular count may be of assistance in differentiating trench fever from meningitis, appendicitis, perinephritic abscess and purulent conditions generally.—C. P. B.

257. *Zur Aetiologie der Febris quintana. (The Etiology of Febris quintana.)* H. WERNER. Centralbl. f. Bakteriöl. (etc.), Jena. I. Abt. Orig., 1919, 82, 571-576.

It has been previously shown that 5-day fever may be transferred from man to man by blood and by the bite of infected lice. The spirochetes of various authors nor the diploorganisms of Jungmann and Kuczyński have been shown to be causally related. The author describes the cultivation from the blood of an organism which he terms *Strongyloplasma febris quintanae*. Ascites and serum agar under anaerobic conditions gave decided clouding in 4 to 7 days. Microscopically the organisms are smaller than staphylococci, spherical or occasionally oval. It is possible that this organism is related to a *Rickettsia* described from the louse.—R. E. B.

258. *Metastatic Abscesses of the Thyroid Associated with Hyperthyroidism.* DAVID GREENBERG. J. Am. M. Ass., Chicago, 1920, 74, 165.

Thyrotoxic symptoms may appear in cases of simple goiter, the result of an acute infection. Bacteria may be the cause of exophthalmic goiter; if not directly so, at least effecting such changes in the physiology of the gland as to make its appearance likely. Suppuration of a thyroid gland should be suspected when there is slight pain and tenderness over the gland with enlargement, especially when there is a history of a preceding infection.—P. G. H.

259. *An Undiagnosed Disease probably of an Infectious Nature.* C. F. ORR WHITE. Practitioner, Lond., 1920, 104, 70-72.

All patients came from a unit of the East Yorks who had freshly arrived in India.

The clinical picture is described at length; sudden onset, severe frontal headache; temperature 99° F. to 103° F.; discrete spots on wrist and lower forearm, then on neck above line of the shirt collar, spreading over arms, chest, back, thighs and legs. A few vesicles appeared in some cases, the vesicles were sterile. These vesicles never became pustular. Dengue, or three day fever, chicken pox and small pox were ruled out.—C. P. B.

260. *Nouvelle enquête sur les rats de Tunis. Recherche du Spirochète de l'ictère infectieux et du bacille de Stefansky. (Further Examination of the Rats of Tunis. Consideration of the Spirochete of Infectious Icterus and of the Bacillus of Stefansky.)* GEORGES BLANC. Compt. rend. Soc. de biol., Par., 1919, 82, 1310.

Of a total of 107 rats examined, 12 were infected with the virus of infectious jaundice. The bacillus of Stefansky was never found.—G. H. S.

## DISEASES OF THE DIGESTIVE SYSTEM

(See also Numbers 106, 226, 445)

261. *Typhoid Fever in the American Army During the World War.* FREDERICK F. RUSSELL. J. Am. M. Ass., Chicago, 1919, 73, 1863.

In Hawaii, 1917, during a water-borne epidemic of typhoid fever the morbidity was four and one-eighth times as high among the unvaccinated as it was among the vaccinated. In 1917 the ratio for the Regular Army was 0.25 per 1000; National Guard 0.70; and National Army 0.27. The relatively high ratio in the National Guard is explained by their mobilization in their own states and therefore they did not come immediately under federal control. Figures show a very marked proportional decrease in the number of cases from the time vaccination became compulsory in the army. The rate of paratyphoid fever in the army was less than one-half the civil rate.—P. G. H.

262. *Zur chirurgischen Behandlung der Typhusbazillenträger. (The Surgical Treatment of Typhoid Carriers.)* J. DUBS. München. med. Wchnschr., 1919, No. 7; Schweiz. med. Wchnschr., 1920, 1, 18.

The carrier in question continued to excrete typhoid bacilli for 3 months after a cholecystectomy had been performed.—G. H. S.

263. *Ueber eine in Wasserepidemie übergehende Milchepidemie von Darmtyphus mit Befund von Typhusbazillen und atypischen Paratyphus B-Bazillen im Brunnenwasser. (A Milk Epidemic of Intestinal Typhoid Passing over into a Water Epidemic with Discovery of Typhoid Bacilli and a Typical Paratyphoid B Bacilli in Well Water.)* ALFRED PETTERSSON. Centralbl. f. Bakteriöl. (etc.), Jena. I. Abt. Orig., 1919, 82, 405-412.

In the fall of 1915 an epidemic of typhoid occurred in Visby, Gotland. The distribution of cases was such as to point to milk from a central plant as responsible. Upon pasteurization of the milk the disease disappeared. The next spring and summer the disease reappeared, but was traced to polluted wells in this case. Typhoid bacilli were isolated from one well, and aberrant strains of paratyphoid B from others.—R. E. B.

264. *Ueber Leberabszesse nach Typhus und über die Rolle der Typhusbazillen als Eitererreger. (Liver Abscess Following Typhoid and the Role of Typhoid Bacilli in Causing Pus Production.)* R. ADLHEIM. Centralbl. f. Bakteriöl. (etc.), Jena. I. Abt. Orig., 1919, 82, 497-517.

Typhoid bacilli were isolated from two abscesses in the liver of a typhoid convalescent, also from the gall bladder. An extended review of the literature is given, together with a discussion of the origin of such abscesses, and the immunological significance.—R. E. B.

265. *Flora microbienne chez les dysentériques. (Bacterial Flora in Dysentery Cases.)* JULIEN DUMAS. Compt. rend. Soc. de biol., Par., 1919, 82, 1308.

A consideration of the atypical dysentery strains isolated from cases of dysentery. Report is made of examinations conducted in 14 epidemics. Four hundred seventy-nine examinations were made; in 95 cases *B. dysenteriae* Shiga and in 35 *B. dysenteriae* Flexner were isolated. From 57 cases the atypical forms were secured. These strains seem to be organisms saprophytic in the large intestine.—G. H. S.

266. *Bakteriologische und serologische Untersuchungen über Dysenterie. (Bacteriological and Serologic Studies on Dysentery.)* M. GOLDBIEHR. Centralbl. f. Bakteriol. (etc.), Jena. I. Abt. Orig., 1919, 82, 437-449.

A study of 94 strains of dysentery bacilli. Isolation from 1479 patients (stools) was successful in 9.53 per cent. Of 28 Shiga-Kruse stains, 2 fermented glucose. Of the 66 atoxic strains, 20 constantly and 27 occasionally fermented glucose. Agglutination reactions are relatively inconstant; long cultivation increases the agglutinability of some strains and decreases that of others.—R. E. B.

267. *Étude d'une épidémie de dysenterie bacillaire. (A Study of an Epidemic of Bacillary Dysentery.)* R. DAMADÉ. Thesis, Univ. Bordeaux, 1919 Presse méd., 1919, 27, 552.

A mild epidemic of 68 cases in Bordeaux. Serum therapy was employed in Shiga cases; vaccine therapy in others. Bacteriological examinations should be made early and often; the material should be inoculated at the earliest moment. With *B. dysenteriae* Shiga agglutination of the patients' serum is diagnostic; with Flexner types, not. Cross-agglutination is found in some patients and in experimentally treated rabbits, which nevertheless show maximal specific antibodies. A discussion of the filterable organism of d'Herelle is included.—L. A. K.

268. *Ueber Agglutination von Paratyphus B bei Bazillenruhr. (The Agglutination of Paratyphoid B in Cases of Bacillary Dysentery.)* G. SIMON. Berl. klin. Wchnschr., 1919, No. 3; Schweiz. med. Wchnschr., 1920, 1, 37.

In only one out of 145 cases of clinical dysentery was it possible to demonstrate a coincident paratyphoid infection. At the same time an agglutination of *B. paratyphosus* B was secured in 25 per cent of the cases.—G. H. S.

269. *Action activante de la muqueuse intestinale sur les propriétés pathogènes du Vibrio cholérique. (Activating Action of the Intestinal Mucosa on the Pathogenic Properties of the Cholera Vibrio.)* J. CANTACUZÈNE AND A. MARIE. Compt. rend. Soc. de biol., Par., 1919, 82, 842.

Experiments are recorded which show that if an extract of the mucosa of the small intestine or the cecum is added to a sublethal dose of cholera vibrios this dose will prove fatal. The experiments were made on guinea pigs and the injections were given intraperitoneally.—G. H. S.

270. *Ueber einen neuen menschenpathogenen Erreger aus der Gruppe der Bakterien der Septicaemia haemorrhagica, genannt "Bacterium cholerae pestiforme." (A New Human Pathogen of the Hemorrhagic Septicemia Group, "Bacterium cholerae pestiforme.")* NIKOLAUS VON NESTLINGER. Centralbl. f. Bakteriol. (etc.), Jena. I. Abt. Orig., 1919, 82, 425-437.

A Gram-negative rod with polar granules, gelatin liquefying, pathogenic for guinea pigs but not for pigeons and rabbits. It was isolated from the feces of two cholera suspects, and from the alimentary tract of one at autopsy. The organism is described in detail, and differentiated from the plague and cholera types. It is named "*Bacterium cholerae pestiforme*."—R. E. B.

271. *Two Cases of Abdominal Actinomycosis.* J. FAWCETT. Guy's Hosp. Gaz., Lond., 1919, 33, 375-379.

Fawcett reports two cases of abdominal actinomycosis, one of which was long standing, and the primary cause was not discovered until a post mortem examination was made; the second case manifested itself clinically as an acute abdominal condition, shortly resulting in abscess formation, with pus in which the "ray fungus" was found. The first case was admitted with a right sided empyema, later multiple abscesses developed beneath the diaphragm and involved the tissues of the abdominal wall. The empyema was opened and drained; the pus on cultivation proved sterile, and a direct examination gave negative results. Abdominal symptoms developed later. Under anesthesia a collection of pus which had collected in the perinephritic region was opened. On cultivation, this pus was sterile. Further abscess formation occurred at the lower margin of the ribs posteriorly involving the abdominal wall; this pus gave *Staphylococcus aureus*, the bacillus of Friedländer, and a diphtheroid

bacillus. Finally, a subphrenic abscess occurred which was opened and drained. The condition of the patient gradually became worse until death occurred about 7½ months after entering the hospital. At autopsy a single abscess about the size of a large orange was found containing pus which on examination showed the "ray fungus," and by anaerobic culture gave a pure growth of *Streptothrix actinomyces*. The abscesses already mentioned communicated with this one and apparently were secondary to it, as were diaphragm and pleural involvements. In the lungs were found numerous small hard nodules about the size of a pea, also showing the actinomycotic fungus. The spleen, pancreas, suprarenals, kidneys, and other viscera were normal. As the appendix showed the signs of an old inflammation, it might possibly have been the original seat of infection in this case. The second case had a sudden onset of pain and stiffness in the abdomen, distributed all over the abdomen, but on the right upper side in particular. The attacks were recurrent, and colicky in character. Some pain with tenderness and general increase of resistance was localized in the upper right side. The local signs of inflammation and swelling increased rapidly a fortnight after admission, indicating an abscess. The swelling was opened, liberating a large amount of pus, showing that the abscess extended into the subperitoneal tissue. On examination, the pus showed the "ray fungus," both on direct examination and on culture. The patient was treated accordingly, and apparently cured. In conjunction with the potassium iodide medication, local treatment of abscess, the patient was given an autogenous vaccine made from the culture of the streptothrix.—L. W. F.

**272. Cultural Studies on a Case of Sprue.** WADE W. OLIVER. J. Am. M. Ass., Chicago, 1920, 74, 27.

A yeast was recovered from a case of sprue and was found to correspond to *Monilia of Ashford*. The yeast was cultivated on glucose agar, 1 per cent acid, from the stool, tongue, sputum and a tooth abscess. A guinea pig was infected intraperitoneally and the animal died in 7 days. The yeast was recovered from the liver and gall bladder, but was mixed with *Staphylococcus aureus*.—P. G. H.

**273. Sur le microbe bacteriophage. (Bacteriophagum intestinale.)** F. D'HERELLE. Compt. rend. Soc. de biol., Par., 1919, 82, 1237.

Strains of bacteriophagous organisms have been isolated which are active against *B. dysenteriae* Shiga, Flexner and Hiss, *B. typhosus*, *B. paratyphosus* A and B, *B. enteritidis*, the bacillus of hog cholera, *B. coli*, *B. proteus*, *B. sanguinarum*, and *B. pullorum*. A study of the question of bacteriophagous organisms leads the author to conclude that there exists in the intestinal tract of man and of animals an organism which is filtrable, which is an obligatory bacteriophage, and which is able to acquire a more or less high degree of virulence for the diverse intestinal bacteria.—G. H. S.

**274. Bacillus botulinus Poisoning: With a Report of Seven Cases, Four of which Proved Fatal.** G. W. McCASKEY. Am. J. M. Sc., Phila., 1919, 158, 57-67.

McCaskey discusses the question of food poisoning in both man and animals and the relation of *B. botulinus* to many of these outbreaks. He notes that "the organism is found much more frequently in vegetable than in animal food." He reports a series of cases where the organism was found only in canned vegetable foods. After noting the clinical findings in his cases, the author discusses the pathology, symptomatology, and treatment of the condition. Specific antitoxin was used in 2 of the 3 cases (who finally recovered) apparently with beneficial results. Concerning the antitoxin, he states that "the experimental and clinical evidence as to the efficacy of the antitoxin in destroying the toxin is sufficiently strong to warrant its use, especially in view of the fact that there is no other treatment worth while."—L. W. F.

**275. An Outbreak of Botulism.** CHARLES G. JENNINGS, ERNEST W. HAASS AND ALPHEUS F. JENNINGS. J. Am. M. Ass., Chicago, 1920, 74, 77.

The outbreak reported occurred at Grosse Point, a suburb of Detroit. The toxin was contained in a glass jar of ripe olives. Four people partook of the olives, although they were soft and had a peculiar odor. Two died and two were made moderately sick but recovered. Later two children and a waitress ate some of the olives and these died. The fluid of the olives was fatal to guinea pigs in doses of 0.01 cc. The food was analyzed in three laboratories and *Bacillus botulinus* was recovered in all examinations.—P. G. H.

**276. Investigation of Five Cases of Botulinus Poisoning at Colusa, September 30, 1919.** FRANK L. KELLY. Month. Bull. Calif. State Bd. Health, 1919, 15, 114-116.

Two patients died, two were ill, and one recovered. The symptoms in all cases were the same except for degree of severity. The two deaths were caused by cardiac failure, and it was concluded that the deaths were due to botulinus poisoning, resulting from home canned fruit and tomatoes. The patients attempted to prepare a home made alcoholic drink from the above products, some of which were from 3 to 4 years old and showed evidence of decom-

position. They emptied the fruit and tomatoes into a pickle barrel, added water and let it stand. A number of people consumed this drink which was followed by all the symptoms of botulinus poisoning.—F. W. T.

**277. Enterointoxication: Its Causes and Treatment.** A. DISTASO AND J. H. SUGDEN. *Biochem. J., Liverp.*, 1919, 13, 153-163.

After feeding rats upon a dietary containing lactose for a few days the feces acquire an acid reaction and a yellow color. The predominant organism is *B. bifidus communis*, which does not produce indol. The urine of such rats is free from indoxyl, skatoxyl, and ethereal sulfates, the production of which can be traced to the activities of the *B. coliformis* group of organisms. (*Physiol. Abstr.*)—G. H. S.

## DISEASES OF THE GENITO-URINARY SYSTEM

(See also Numbers 350, 352, 357)

**278. One Aspect of Syphilis as a Community Problem.** H. S. NEWCOMER, R. RICHARDSON, C. ASHBROOK AND P. A. LEWIS. *Am. J. M. Sc., Phila.*, 1919, 168, 141-165.

Lewis, in an introduction to the article, discusses the prevalence of syphilis as revealed by published statistics, and points out the gravity of the situation. In order to cope with the problem, a coordination should be brought about between specialists, including educators, physicians, police, sociologists, etc. The development of the organization for this work in the Pennsylvania Hospital Clinic is reviewed, and some of its practical aspects discussed. In particular, Newcomer outlines the organization and management of the clinic, with the routine followed in the administration of salvarsan; the results of treatment are discussed and tabulated. He also considers the salvarsan reactions, and notes his experiences with salvarsan from different sources. Of special interest to the laboratory worker are his observations on the Wassermann reaction. The reaction was found to vary from time to time in the same individual with a clinical diagnosis of syphilis. The data are tabulated. It is concluded that "little reliance can be placed upon a single Wassermann as far as indicating the patient's condition is concerned," also that "as a general rule, the strength of the reaction bears no relation to the course of the disease." Usually cholesterolized antigen gives more positives in patients with syphilis than any other Wassermann system, and he feels that it is safer to use than any other system as a guide in treatment, although the cholesterolized antigen may be too sensitive, and may give weakly positive or strongly positive reactions with normal individuals. Richardson discusses briefly syphilis and pregnancy, noting the results of his experience in the Pennsylvania Hospital in a series of 12 syphilitic women. Lewis concludes the article with a general summary of the broader consideration of the problem as a whole as indicated in the title.—L. W. F.

**279. The Diagnosis of Late Syphilis of the Central Nervous System.** C. FROTHINGHAM. *Am. J. M. Sc., Phila.*, 1919, 168, 312-319.

Discussion of a series of cases, observed at the Peter Bent Brigham Hospital, with syphilis of the central nervous system. Especial attention is given to means of diagnosis, and the value of the Wassermann reaction as carried out on the spinal fluid. It is concluded that the examination of the spinal fluid "opens up a means of diagnosing late syphilis of the central nervous system when other diagnostic means fail" in a small percentage of cases. Such diagnosis is of importance in order that the spinal form of treatment be instituted early in the disease.—L. W. F.

**280. Quand doit-on analyser le liquide céphalo-rachidien d'un syphilitique? (When Should the Cerebro-Spinal Fluid of a Syphilitic be Examined?)** PAUL RAVAUT. *Presse méd., Par.*, 1919, 27, 573.

Repeated pictures, which are desirable, are hard to get. The most important function of the examination is to detect neurological lesions before their development has produced clinical signs. From the study of a thousand cases, the author advises examination during the fourth year (to detect any tendency towards cerebro-spinal localization), and, if possible, after 10 years. It is at these times that a pathological fluid with no clinical symptoms has the greatest significance.—L. A. K.

**281. Zur Bakteriologie der Pyelitis und über Beziehungen der letzteren zur diffusen Glomerulonephritis. (The Bacteriology of Pyelitis and the Relation of the Latter to Diffuse Glomerulonephritis.)** E. BECHER. *München. med. Wochenschr.*, 1918, No. 51.

A case report. The glomerulonephritis was probably of independent origin from the pyelitis, although both may have been due to the same etiologic agent. (*Cor.-bl. f. Schweiz. Aerzte.*)—G. H. S.

**282. A Case of Pyonephrosis Occurring in a Polycystic Kidney.** A. McKENZIE. *Guy's Hosp. Gaz., Lond.*, 1919, 33, 316.

A report of a case of pyonephrosis with clinical history showing *B. coli communis* in catheterized specimen of urine. An operation was performed for a diagnosed subphrenic abscess, much pus was evacuated, which in culturing gave the same organism. The patient showed no improvement so a second operation was performed. Two days later the patient died, an autopsy was performed which revealed some general peritonitis. Both kidneys were found to be large and cystic.—L. W. F.

## DISEASES OF THE LOCOMOTOR SYSTEM

**283. Meningococcus Arthritis.** W. W. HERRICK AND G. M. PARKHURST. *Am. J. M. Sc., Phila.*, 1919, 158, 473-481.

The authors note the frequency of arthritis in association with meningococcus infection. In a study of 321 cases of meningococcus infections observed at Camp Jackson, N. C., from November, 1917 to April, 1919, the arthritides manifested occurred in such variety that they could be classed in different forms or types. Each type had peculiar significance in diagnosis, prognosis, and treatment, and are divided into three groups which are designated "Type A," "Type B," and "Type C." The writers discuss the different types fully, and tabulate their observations. Of special interest are the bacteriological findings in the joint exudate. The exudate was not examined in cases classed as Type A, but in Type B the meningococcus was present in one-third of the cases, while in Type C the examination gave negative results.—L. W. F.

**284. A propos de l'étiologie du rhumatisme articulaire. (The Etiology of Articular Rheumatism.)** CHARLES COHEN. *Compt. rend. Soc. de biol., Par.*, 1919, 82, 925.

A diplococcus resembling the gonococcus was isolated from the blood (3 successive tests at several days' intervals) in a severe case of articular rheumatism. This observation was made in 1916 and the organism has not been found in any cases since that time. The organism was Gram-negative, morphologically similar to the gonococcus and the meningococcus except that it was somewhat larger, would not grow in ascitic media and that it grew with difficulty on blood agar. It was non-pathogenic for laboratory animals. The sera from 28 cases of articular rheumatism were tested in the complement fixation test against it as antigen, with the following results: 12 sera gave strong positives, 6 gave weak positives, 10 gave negative reactions. An etiological relationship to articular rheumatism is suggested.—G. H. S.

## DISEASES OF THE NERVOUS SYSTEM

(See also Numbers 252, 279, 283, 314)

**285. Lethargic Encephalitis. A Notifiable Disease in England.** *Pub. Health Rep., Wash.*, 1919, 34, 314-318.

The disease occurred first perhaps in Germany at the end of the seventeenth and beginning of the eighteenth centuries and in Upper Italy and Hungary in 1890. Very suggestive cases occurred in nearly all the countries of Europe and in the United States in the spring of 1895. A slight epidemic occurred in England from Feb. to June, 1918. The disease is now notifiable in England and Wales. The disease is an acute affection due to a specific virus which finds entrance through the naso-pharynx and is characterized by manifestations originating in the central nervous system of which the most frequent is progressive lethargy or stupor and lesion in or about the nuclei of the third pair of cranial nerves. There may be double facial paralysis. MacNalty recognizes seven types of cases; (a) a clinical affection of the third pair of nerves, (b) affection of the brain stem and bulb, (c) affections of the lung tracts, (d) the ataxic type, (e) affections of the cerebral cortex, (f) cases with evidence of spinal cord involvement, and (g) the polyneuritic type in which affection of the peripheral nerves is suspected. Among 168 cases, 37 deaths were recorded.—C. E. T.

**286. Lumbar Puncture as a Factor in the Causation of Meningitis.** P. WEGEFORTH AND J. R. LATHAM. *Am. J. M. Sc., Phila.*, 1919, 158, 183-202.

In a previous experimental study carried out in the army neuro-surgical laboratory, it was found that the release of cerebrospinal fluid from animals during certain artificial septiciemias induced a localized infection in the meninges. This observation directed attention to the possible clinical importance of lumbar punctures in cases of septicemia. The authors investigated the subject from the clinical standpoint during the fall of 1918 at Camp Jackson,



S. C. They analyzed a series of cases covering pneumococcus and meningococcus infections. In a careful study of these cases they found 5 which would support the view that meningeal infections might follow the release of normal spinal fluid by lumbar puncture during a septicemia. This procedure should be seriously considered as a causative factor, under certain conditions, in the production of meningitis. The authors offer certain recommendations "to prevent the possible accidental production of a meningitis as a result of diagnostic lumbar puncture." These include a careful bacteriological study of the blood before making spinal punctures; such procedure should be avoided in acute diseases in the absence of definite signs of irritation of the central nervous system unless it is first conclusively shown that the blood stream is free from infection; minimal amounts of the fluid, sufficient only for necessary laboratory tests, should be withdrawn when clinical symptoms are such as to render a lumbar puncture advisable; a small bore needle is recommended for the operation.

An extensive review of the literature bearing upon the subject is analyzed and discussed.—L. W. F.

287. *Ueber die epidemische Meningitis. (Epidemic Meningitis.)* HERMANN LÜDKE. Deutsche med. Wchnschr., Berl. & Leipz., 1918, No. 50.

The subject is treated from the clinical, bacteriological and therapeutic points of view. The frequency of exanthema, an expression of a general intoxication, renders lumbar puncture the only sure means for differential diagnosis. In 7 of 28 cases the causative organism was found in the circulation. In 2 cases, both convalescent, the meningococcus was found in the blood and not in the spinal fluid. Not only is there a meningococcus septicemia in meningitis, but the blood may become invaded by other organisms, and present a mixed infection. Aside from the micrococcus of Weichselbaum and the pneumococcus, other organisms, *Micrococcus flavus* and *Micrococcus mucosus*, may be the cause of meningitis. Serum treatment is not favored; repeated drainage of the spinal canal is approved. (Cor.-bl. f. schweiz. Aerzte.)—G. H. S.

288. *A Case of Cerebrospinal Meningitis Due to a Diphtheroid Bacillus.* GEORGE F. DICK. J. Am. M. Ass., Chicago, 1920, 74, 84.

Pseudodiphtheria bacilli have not been recognized as the cause of meningitis and such cases are rare but important in view of the fact that pseudodiphtheria bacilli are frequently found in the nose. The organism obtained from the case reported differs from diphtheria bacilli in the absence of polar bodies; failure to acidify maltose and dextrin; and being non-pathogenic for guinea pigs. The bacillus found resembles in morphology and staining the Hoffman type. It ferments glucose with acid formation. It is pathogenic for guinea pigs when injected intraperitoneally.—P. G. H.

289. *Premier cas en Suisse, avec autopsie, de poliencéphalite aiguë (dite encéphalite léthargique épidémique.) (First Case, with Autopsy, of Epidemic Encephalitis Lethargica in Switzerland.)* G. MÜLLER-BERGALONNE. Cor.-bl. f. schweiz. Aerzte, Basel, 1919, 49, 1695-1703.

A detailed account of the gross and histologic pathology of the condition as noted in the case reported.—G. H. S.

290. *Le symptôme "démangeaisons" dans la rage humaine. (The Itching Symptom in Human Rabies.)* LÉOPOLD ROBERT. Presse méd., Par., 1919, 27, 584.

In 8 cases of human rabies observed in Siam, pruritus of the bitten region was a constant prodromal symptom.—L. A. K.

## DISEASES OF THE RESPIRATORY SYSTEM (EXCEPT INFLUENZA AND TUBERCULOSIS)

(See also Number 424)

291. *The Relation of Proleolytic Enzymes in the Pneumonic Lung to Hydrogen Ion Concentration. An Explanation of Resolution.* FREDERICK T. LORD. J. Exper. M., Balt., 1919, 30, 379-388.

The suggestion is made that since pneumococci produce acid in culture media and the reaction of pneumococcal lungs is acid, crisis and recovery may be due to local biochemical changes in the course of which the acid death point of the pneumococcus is reached. The material for the present study on factors influencing resolution in pneumonia was obtained from the lung tissue of three fatal cases of pneumonia, in the gray or gray-red stage of hepatization. The lung was passed through a nut butter cutter, the resulting fluid from the mash

filtered through cheesecloth and centrifuged; the sediment was washed in saline and recentrifuged. It contained pus cells, large mononuclear cells and pneumococci, and was rendered sterile by the addition of chloroform. This cellular suspension was used as enzyme, its activity being due perhaps to a ferment liberated by the cells.

It was found that Löffler's blood serum slants of varying pH were eroded by contact with the sterile cellular material from pneumonic lungs in hydrogen ion concentrations of 7.3 to 6.7, but that the enzyme was inactive at more acid concentrations. A proteolytic enzyme was also demonstrated capable of splitting Witte's peptone to amino acid nitrogen. This enzyme was operative at hydrogen ion concentrations of 8.0 to 4.8, but most active at 6.3 to 5.2. The presence of an enzyme liquefying gelatin could not be demonstrated by the method employed.

The findings are regarded as having a bearing on resolution in pneumonia. It is suggested that during the course of the disease a gradual increase in the hydrogen ion concentration of the exudate probably takes place. With the breaking down of cellular material an enzyme digesting protein (fibrin) in weakly alkaline or weakly acid media may be liberated. With a gradual increase in the hydrogen ion concentration of the pneumonic lung, the action of this enzyme probably ceases. An enzyme capable of splitting peptone to amino acid nitrogen is probably active during the proteolysis of the fibrin and further activated when the hydrogen ion concentration of the pneumonic lung is increased to within its range of optimum activity at a pH of 6.3 to 5.2. By this means it may be conceived that the exudate is dissolved and resolution takes place.—I. W. P.

**292. *Spirilloses pleurales au cours d'un hémithorax traumatique.* (*Spirillar Pleurisy in the Course of a Traumatic Hemothorax.*)** EDGAR LANCUREUX. *Presse méd.*, Par., 1919, 27, 556.

The second puncture in a wounded soldier revealed numerous spiral organisms, demonstrable by dark-field, Fontana or polychrome methylene blue stains, and having no undulating membrane. The breadth of the spirals was 1.2 micra; the length of an individual spiral 1 micron, and from 3 to 30 spirals per organism. Cultures were unsuccessful. No associated bacteria were demonstrated. Fever subsided on repeated puncture and treatment with novarsenobenzol. Infection is attributed to the original wound.—L. A. K.

**293. *Spirochétose bronchique (Castellani).* (*Spirochetal Bronchitis.*)** NAJIB FARAH. *Presse méd.*, Par., 1919, 27, 774.

An account of 10 cases in Egypt. *Spirochæta bronchialis* was found in sputum stained with carbol-fuchsin, gentian violet, or Fontana; it was Gram-negative. Intramuscular injections of iodine (54 per cent solution in poppy-oil) proved efficacious.—L. A. K.

**294. *Die spezifische Behandlung der genuinen Pneumonie.* (*The Specific Treatment of Genuine Pneumonia.*)** CARL KIENESEBERGER. *Deutsche med. Wchnschr.*, Berl. & Leipz., 1918, No. 45.

A report on the treatment of pneumonia by the intravenous injection of polyvalent anti-pneumococcus serum. (*Cor.-bl. f. schweiz. Aertze.*)—G. H. S.

**295. *Le traitement des pleuritis purulentes par la méthode de Carrel-Dakin.* (*The Treatment of Purulent Pleurisy by the Carrel-Dakin Method.*)** P. TASSIN. Thesis, Univ. Nancy, 1919. *Presse méd.*, Par., 1919, 27, 658.

Except in tuberculous pleurisy, the Carrel-Dakin method gives excellent results.—L. A. K.

## INFLUENZA

(See also Numbers 63, 407, 408, 423, 480, 482)

**296. *Influenza and Maritime Quarantine in Australia.*** J. H. CUMFSTON, pp. 1-72; 114-176. *Influenza Vaccine and Inoculation.* W. J. PENFOLD, pp. 73-88. *Value of Inoculation—A Statistical Study.* T. M. CHERRY, pp. 89-113. Commonwealth of Australia, Service Publication No. 18, Melbourne, 1919, pp. 1-176.

It may be stated definitely that during the 3 months, October, November and December, maritime quarantine in Australia had the effect of holding at the sea frontier the intensely virulent and intensively infective form of influenza prevalent in all other countries. The contrast between the absolute immunity enjoyed by Australia and the appalling death rate elsewhere was sufficient evidence of the success of the measures employed. This immunity persisted until the end of January, when an infection, characterized by a slower rate of spread and a death rate so much lower than that experienced by overseas countries that it is hardly comparable, became prevalent.

A review of the ship epidemics demonstrated that inhalation of antiseptic sprays, inoculation and isolation would not of themselves stop an epidemic; that exhaustion of susceptible material played little part; and that the factor which determined the course of the epidemic was the inherent nature and vigor of the infecting agent. The question of the use of prophylactic vaccination with a composite vaccine was considered early. Upon trial the results were so satisfactory that vaccine was prepared on an extensive scale. In order that

results of inoculation might be studied and presented under conditions which eliminated any suggestion of bias the services of Cherry and Penfold were enlisted. The influenza vaccine (sterilized by tricresol) was made in two strengths of the following composition:

<i>"A" strength per cubic centimeter</i>	
<i>B. influenzae</i> .....	25 million
<i>M. catarrhalis</i> .....	25 million
<i>Pneumococcus</i> .....	10 million
<i>Streptococcus</i> .....	10 million
A Gram-positive <i>Diplococcus</i> (not the <i>Pneumococcus</i> ) isolated from all cases examined.....	10 million
<i>"B" strength per cubic centimeter</i>	
<i>B. influenzae</i> .....	125 million
<i>M. catarrhalis</i> .....	125 million
<i>Pneumococcus</i> .....	50 million
<i>Streptococcus</i> .....	50 million
A Gram-positive <i>Diplococcus</i> as above.....	50 million

The doses employed were those of the English committee. The use of the vaccine, according to the author, was associated with a fall in the incidence and case mortality of the disease, the ratio of deaths in the inoculated and uninoculated groups being as 5 to 24. Some small part of this improvement was apparently associated with earlier hospitalization of the inoculated. Inoculation should be more widespread. The doses used were relatively small and might with advantage be increased. Repetition of the process would almost certainly augment the immunity. Where inoculation was used as a method of treatment, the good effect on the clinical course of the cases so treated was unmistakable.—E. G. S.

297. *Notes on Sixty cases of Pneumonic Influenza treated with the Mackinnon-Ray Vaccine.* ARTHUR GRIEVES. Med. J. Australia, Sydney, 1919, 6th year, 2, 128.

Sixty patients were treated with Mackinnon-Ray vaccine (formula not given). The author believes this vaccine adds to the patients' chances of recovery.—G. P. B.

298. *Some Interesting though Unsuccessful Attempts to Transmit Influenza Experimentally.* G. W. McCOR. Pub. Health Rep., Wash., 1919, 34, 33-36.

In order to ascertain the nature and mode of spread of the virus of influenza, two series of experiments were carried on at the Naval Stations of Boston and San Francisco. The subjects of the experiment at Boston had been exposed in some degree to an epidemic of the disease prior to inoculation, but 47 of the 68 inoculated had had no attack during the epidemic. The subjects at San Francisco had not been exposed to the disease in the present epidemic but had been vaccinated with a bacterial vaccine containing Pfeiffer's bacilli, the three fixed types of pneumococci and hemolytic streptococci. The experiments consisted of inoculations into the nose with pure cultures of Pfeiffer's bacillus (recently isolated, filtered and unfiltered) and with secretions from the upper respiratory passages of patients in the active stage of the disease. Subcutaneous injections of patients' blood were also made. In one experiment the interval of time elapsing between securing nasal secretions and inoculation of the same was only 30 seconds. A group of subjects which had been thus inoculated were intimately exposed to patients at 10 to 83 hours, from the onset of the disease. Nasal secretions filtered were also inoculated subcutaneously and into the conjunctivae. These experiments all proved negative in producing the disease.—C. E. T.

299. *The Relation of the Bacillus influenza to the Recent Epidemic.* G. MCCONNELL. Am. J. M. Sc., Phila., 1919, 158, 47-56.

Certain questions concerning the recent influenza epidemic remain unanswered. In particular, the sources of the epidemic, date of its inception, and the etiological factor are considered. An extensive review of the literature on the subject is submitted, and the data are analyzed. Concerning the etiology, after considering the published results, the author concludes that the evidence is not in favor of the *Bacillus influenzae* being considered the etiological factor in the recent epidemic.—L. W. F.

300. *Fungous Developmental Growth Forms of Bacillus influenzae. A Preliminary Note.* H. W. WADE AND C. MANALANG. J. Exper. M., Balt., 1920, 31, 95.

Three strains of a Gram-negative, hemoglobinophilic bacillus, presumably *B. influenzae*, when grown in beef infusion bouillon made with peptone and sodium chloride in various dilutions, developed long filamentous forms, round spore-like bodies of varying sizes, terminal knobs, lateral buds and true branching forms, and, the authors believe, conidial bodies analogous to the conidiospores of many species of *Discomyces*. Similar atypical forms developed when grown in symbiosis with streptococci. Subcultures on blood agar usually failed to develop, or produced very delicate colonies of minute beaded forms, whereas the authors were unable to perpetuate the fungous type of growth in fluid media. The question is raised as to the possibility of a simpler phase as well, with minute filter passing elements as an explanation of the theory of a filterable virus as the etiological agent in infections attributed by other investigators to the influenza bacillus.—W. P. B.

301. *Ein filtrierbarer Erreger der Grippe. (A Filtrable Cause of Grippe.)* v. ANGERER. München. med. Wchnschr., 1918, No. 46.

The sputa of influenza patients were injected into mice and filtrates of the blood of the mice were planted into glucose broth. Very small, refractile bodies with molecular motion were observed. Similar bodies were observed in cultures from the heart blood and the lung extracts of patients. Cultures on solid media were not secured. While the bodies stained with fuchsin, no structure could be observed. The hanging drop method is most satisfactory for demonstration. These filtrable bodies are considered as being the causative agent in influenza. (Cor.-bl. f. schweiz. Aerzte.)—G. H. S.

302. *Secondary Infections in Influenza.* P. S. MESSENT. Med. J. Australia, Sydney, 1919, 6th year, 2, 351-353.

Report is made of an interesting series of complications occurring among 240 cases of pneumonic influenza due to the pneumococcus: one case of cystitis; five cases of peritonitis; two cases of empyema, one of them also having purulent pericarditis; one case of meningitis; other cases are also included but bacteriological examination is not recorded.—C. F. B.

303. *Sulla frequenza del bacillo di Pfeiffer nel muco faringeo degli ammalati di influenza. (On the Incidence of Pfeiffer's Bacillus in the Pharyngeal Mucus of Influenza Patients.)* L. PIRAS. Igiene mod., 1919, 12, 1.

"Sputa and pharyngeal exudates from 35 patients were submitted to microscopic and cultural examination and *B. influenzae* was found in pure culture in 21 (60 per cent). This result occurred in cases examined within 12 hours of the onset of the disease. After this time mixed cultures were the rule." (A. D. in Med. Sci. Abs. & Rev., Lond., 1919, 1, 108.)

304. *Account of an Epidemic of Influenza Among American Troops in England.* F. M. MEADER, J. H. MEANS AND J. G. HOPKINS. Am. J. M. Sc., Phila., 1919, 158, 370-397.

The authors present epidemiological, clinical, and pathological observations on American troops in England during the epidemic of influenza, between September 20 and November 14, 1918. The epidemiological findings indicated that the disease was a highly contagious acute respiratory tract affection. Mortality was about twice as high on board transports as on shore. Prompt isolation of all men showing temperatures and increasing the amount of space allotted to a man were the most effective means found for controlling the outbreak and for diminishing the mortality. No curative measures of value were found. It is highly important that the cases be moved as little as possible, and be put to bed as soon as possible. The original infection is probably an entity, with a low mortality (nearly zero) when uncomplicated, but bronchopneumonia occurs as a complication and is responsible for nearly all the deaths. The authors were unable to draw definite conclusions as to the etiological factor causing the primary infection, but note that "we can only state that this epidemic was due to infection by either the bacillus of Pfeiffer or by some microorganism not recoverable by the methods employed." While not conclusive, the evidence in favor of *B. influenzae* as the primary factor of the epidemic was based upon the frequency of its presence post-mortem in the consolidated lung, it being often the only organism found in the early cases; its presence in the fresh consolidation rather than in the older lesions; its frequency in the sputum and naso-pharynx of uncomplicated grippe cases. They considered that the streptococcus, pneumococcus, staphylococcus, and meningococcus were secondary invaders.—L. W. F.

305. *The Influenza Epidemic of 1918 in the American Expeditionary Forces in France and England.* W. J. MACNEAL. Proc. Soc. Exper. Biol. & Med., N. Y., 1919, 16, 89-90.

In a general discussion of the subject, the author notes an increase in the malignant character of the disease since the first months of its appearance, and the occurrence of fatal bronchopneumonia. At autopsy, especially in fulminant cases, the influenza bacillus was found in the bronchi in large numbers. Most autopsies also showed pneumococci of various types, streptococci, and sometimes staphylococci. Usually blood cultures taken during life were negative, but in some cases pneumococci or streptococci developed. He considers the bacillus of Pfeiffer as "the apparent cause of the epidemic disease but its causal relationship is not conclusively proved." Vaccines are of questionable value. The secretions of the nose and throat are the means of spreading the contagion. Endemic influenza is widely prevalent in France, and evidence suggests that the epidemic originated from that source.—L. W. F.

306. *Laboratory Report on Epidemic Pneumonia.* W. G. DWINELL. Am. J. M. Sc., Phila., 1919, 158, 216-232.

The author discusses and tabulates the results of the laboratory examinations carried out by the laboratory of the Base Hospital at Camp Dodge, Iowa, during the epidemic of pneumonia occurring in 1918. In a series of 152 admission cases of uncomplicated influenza cultures taken showed that the *B. influenzae* was present in 66 per cent, *Streptococcus hemolyticus* in 45 per cent, and *Micrococcus catarrhalis* in 71 per cent of the cultures. In a series of 53 pneumonia autopsies, 80.7 per cent showed the *Streptococcus hemolyticus*, either in lung, pleural cavity, or from the heart's blood (52 per cent cultures), while 9.6 per cent showed

*B. influenzae*: Five times a non-hemolytic streptococcus was recovered, and the *Staphylococcus aureus* twice. The influenza bacillus was found in a large number of cultures in a second series of 69 influenza pneumonia autopsies, probably due to an improved technic. In the later series, 49.3 per cent showed *B. influenzae*, 59.4 per cent, the hemolytic streptococcus; 24.6 per cent, non-hemolytic streptococcus; 18.9 per cent hemolytic staphylococcus; while 1.5 per cent showed Type I pneumococcus; 2.9 per cent, Type II pneumococcus; 5.8 per cent Type III; and 1.5 per cent, Type IV. The author discusses some of the complications, the cause, and the clinical course of pneumonia. The pathology is also considered. Blood count data are analyzed from a series of 3600 examinations. Hemolytic streptococci were isolated from the blood 15 times in a series of 12 cases, and the pneumococcus (Type IV) 14 times in 9 cases. *Staphylococcus aureus* was isolated 7 times from the blood stream; non-hemolytic, short-chain streptococcus was found 3 times, pneumococcus, Type I twice, Type II once, and Type III three times. Of 158 pleural fluids from 75 cases, 46.8 per cent showed hemolytic streptococci; 8.9 per cent, *B. influenzae*; 13.9 per cent hemolytic staphylococci; 7.6 per cent, non-hemolytic streptococci; 7.6 per cent, Type I pneumococcus; 5.1 per cent Type III; and 3.2 per cent, Type IV pneumococcus. Of 458 sputa typed during the epidemic, 31.8 per cent showed hemolytic streptococcus; 41 per cent, non-hemolytic streptococcus; 23.4 per cent *B. influenzae*. The pneumococcus types, showing method used, were as follows:

	TYPE I	TYPE II	TYPE III	TYPE III	TYPE IV
Mouse method.....	11	3	1	5	13
Avery method.....	7	8	9	11	100
	18	11	10	16	113

The results of nasopharyngeal cultures are tabulated according to methods showing the prevalence of hemolytic streptococci and *B. influenzae*:

	CASES	PER CENT OF HEMOLYTIC STREPTOCOCCI	CASES	PER CENT OF INFLUENZA
September.....	312	34.25	152	66.00
October.....	147	25.33	82	27.00
November.....	640	34.51	464	51.41

In the tuberculosis ward 57 cases (Nov. 29, 1918) showed 30 per cent hemolytic streptococcus and 59 per cent *B. influenzae*.—L. W. F.

307. *Laboratory Studies in Influenza at Camp Travis, Texas*. P. B. MATZ. Am. J. M. Sc., Phila., 1919, 158, 723-730.

A report of the results of the laboratory findings in cases of epidemic influenza studied at the Base Hospital at Camp Travis. Besides the usual bacteriological examinations, the results of urine and blood examinations, and the blood chemistry in bronchopneumonia and acidosis are fully tabulated. The gross and microscopical autopsy findings in post-influenzal bronchopneumonia are also discussed. The bacteriological examinations included a study of organisms found in the nasopharyngeal and pulmonary secretions and exudates; the results are tabulated for 968 cultures which were cultured on defibrinated blood agar plates. The bacillus of influenza was found in 39 per cent of the 868 throat cultures examined. Pneumococci as found in the bronchopneumonia, pleurisy, empyema, and meningitis cases were typed in a certain number of instances. The blood cultures in the influenza cases were all negative. In the complicating bronchopneumonias 11 per cent of the blood cultures were positive; the pneumococcus was recovered in these cases.—L. W. F.

308. *Relationship of the Streptococcus hemolyticus to "Influenza" and Pneumonia*. M. B. LEVIN, D. A. GOODMAN AND F. J. PANCOAST. Am. J. M. Sc., Phila., 1919, 158, 202-211.

The authors reviewed the laboratory findings in all cases of diagnosed "influenza" and pneumonia at United States Army General Hospital No. 2, (Fort McHenry, Md.) during the period from September 1, 1918 to January 1, 1919. It was found that *Streptococcus hemolyticus* was very commonly associated with these conditions. Of 554 sputa examined, the *Streptococcus hemolyticus* showed a great predominance over other organisms. A tabulation of the sputa and nose and throat cultures showed the *Streptococcus hemolyticus* present in 554 instances (91.3 per cent), the pneumococcus in 34 (6.15 per cent), *B. influenzae* in 7 (1.26 per cent), *Staphylococcus aureus* in 5 (0.92 per cent), and *Micrococcus catarrhalis* in 2 (0.36 per cent), making a total of 554 examinations. The pneumococci were grouped by types. A great percentage of apparently normal healthy individuals carry *Streptococcus hemolyticus* in their throats. It was found in a series of 100 apparently normal individuals not suffering from

influenza or pneumonia; 55 per cent showed *Streptococcus hemolyticus* in throat cultures during the months of May, June, and July. Of 62 antemortem blood cultures none showed the *Streptococcus hemolyticus*, but of 14 postmortem heart and lung cultures, 13 showed this organism. Of 24 antemortem pleural cultures 8 showed the *Streptococcus hemolyticus*, while 54 postmortem pleural cultures showed positive results in 53 instances. They found that "1 per cent blood-dextrose bouillon, the blood in nearly all cases used in 5 to 10 per cent proportions, having been human blood citrated," gave the best results in the cultivation of the *Streptococcus hemolyticus*. In urine examinations no precipitins or agglutinins were found against the *Streptococcus hemolyticus*. The opsonic index in *Streptococcus hemolyticus* pneumonia cases, both previous to and after the crisis, was slightly lower than normal. The organism failed to grow when incubated with sodium citrate in concentrations greater than 2.5 per cent. The blood of *Streptococcus hemolyticus* pneumonia patients, taken either before or after crisis, showed some inhibitive action to the growth of the organism in test tube tests. Agglutinins up to 1 to 320, and precipitins to 1 to 10 were found by tests in pleural fluids. The authors report the results of a series of animal experiments with this organism, and the results of pleural fluid from certain selected cases, also the effect of blood serum when injected into test animals. A summary with discussion of the pathological findings from 104 autopsies is reported.—L. W. F.

309. *Some Observations on the Recent Epidemic of Influenza.* G. L. ROHDENBURG. Proc. N. York. Path. Soc., 1918, 18, 77-83.

The author discusses the development of the late influenza epidemic as studied in different districts in New York City, showing first its localized character, then its generalization. An apparent natural racial immunity was observed—"amongst 90 white nurses at the Lenox Hill Hospital 30 cases occurred, 6 being dangerously ill with pneumonia, and 1 dying, while at the Lincoln Hospital 89 negro nurses of the same age were on duty, 10 of whom became infected. All of these cases were mild, save 2, 1 of whom died."

The sex and age incidence is analyzed, also the pneumonia complications and mortality data are given. Bacteriological examinations were made upon blood, sputum, and post-mortem cultures from both blood and lungs. In a total of 45 blood cultures only 1 was positive (pneumococcus). Culture and smear examinations were made 198 times on sputum with the following results: "*B. tuberculosis* was found once, pneumococcus five times, *B. influenzae* seven times, and a streptococcus 136 times." Two types of streptococci were found—a diplostreptococcus which either hemolyzed blood, or appeared as the viridans type, the other did not occur in pairs, but hemolyzed blood. A diplostreptococcus of the hemolytic type was found 20 times and a pneumococcus twice in a series of 22 post-mortem lung cultures. Post-mortem blood cultures were sterile. Agglutinin and precipitin tests were made with the serum from a series of 47 cases, against the influenza bacillus, both types of streptococci, the pneumococcus types, and staphylococci. No agglutinin or precipitin could be demonstrated against influenza, but did show in 20 instances against the streptococcus; no action was observed in 27 instances. The pathological changes observed in various tissues are discussed.—L. W. F.

310. *A Review of the Epidemic of Influenza at the Base Hospital, Camp Beauregard, La., with Special Reference to Symptoms and Sequelae.* D. J. FRICK. Am. J. M. Sc., Phila., 1919, 158, 68-80.

The author discusses the influenza epidemic as experienced in Camp Beauregard, La., which extended from September 24 to October 18, 1918. The disease was most virulent at the beginning. Approximately 50 per cent of the command had the disease. He states that "of the 7500 cases of influenza, 1474 developed pneumonia, or 19.6 per cent. Of these 1474 cases of pneumonia, 417 died, a mortality of 29 per cent." The symptoms, complications, etc., are fully discussed and statistics given. Data are published bearing upon the paper. The etiological factor, based upon laboratory reports, was considered to be the influenza bacillus, and the disease a true influenza.—L. W. F.

311. *Bacteriological Observations on the Epidemic of Influenza at Camp Beauregard, La.* J. E. McCLELLAND. Am. J. M. Sc., Phila., 1919, 158, 80-87.

McClelland reports the laboratory findings observed between September 24 and October 20, during an influenza epidemic at Camp Beauregard, La. The epidemic was quite extensive, and the author estimates that at least 50 per cent of the command acquired the infection. The Base Hospital admitted 4980 cases diagnosed clinically as influenza, of which 1322 developed pneumonia. There were 416 deaths. Approximately 13,000 men were in the division. Many cases of less severity were treated in the regimental infirmaries; others never went on sick report. In the group of 300 nurses, 149 became ill, and of 610 men in the Base Hospital Detachment, 327 went on sick report. The apex of the epidemic was reached about the end of the first week. From an extensive study of cases, materials, etc., during the course of the epidemic, the author summarized the findings. It was found that the *B. influenzae* could be demonstrated in nose and throat cultures from a large percentage of patients. Also about 5.7 per cent of the patients were carriers of hemolytic streptococci. Sputa from patients with productive coughs showed both *B. influenzae* and pneumococci. Type IV pneumococci predominated in the sputum of cases of post-influenzal pneumonia, with a relatively large number of Type III; the Army method was used for the determination of types. Of the blood cultures

made, about 50 per cent of the pneumonia cases gave positive cultures,—again the percentage of Type III and Type IV pneumococcus infection was high. *B. influenzae* was not recovered from the blood in any case, either ante-mortem or post-mortem. Pneumonia with septicemia showed 88.8 per cent mortality; all patients died who had a Type III septicemia. Only a small number of cases showed Type I pneumococci, of these 4 received serum and all recovered. All cases with hemolytic streptococcus septicemia died, but the relative number of hemolytic streptococcus septicemia was small. Two cases only of pneumococcus meningitis occurred; both patients had pneumococci in the blood stream. The empyemas occurring did not differ from those with ordinary pneumonia. *B. influenzae* was not found in the pleural fluids on culturing, although pneumococci and streptococci were found. Sterile fluids were of rather frequent occurrence. At autopsy a very extensive bronchopneumonia was found in the majority of the cases. Both *B. influenzae* and pneumococci were recovered in smears and cultures. Usually post-mortem blood culture showed some type of pneumococcus.—L. W. F.

**312. *Pneumonia as a Complication of Epidemic Influenza.* A. V. BOCK AND J. L. STODDARD. Am. J. M. Sc., Phila., 1919, 158, 407-420.**

A report of the results of a study upon 39 cases of pneumonia occurring among English and American soldiers in the fall of 1918 during the epidemic of influenza in Flanders and northern France. Of these cases, 25 had lobar pneumonia due to pneumococcus infection, the remainder were bronchopneumonia. Confirmatory evidence as to the character of the lesion was gained at necropsy in fatal cases. A high mortality rate occurred; of the 25 cases of lobar pneumonia, 17 died and 8 lived; while of 14 cases of bronchopneumonia, 11 died and 3 recovered. The chief bacteriological study of the cases was made by blood culture. Of 22 cases of lobar pneumonia, 13, or 59 per cent, were positive, and 9, or 41 per cent, were negative. The types of pneumococci found in the 13 positive cases showed that 1 belonged to Type I, 11 to Type II, and 1 to Group IV. A study of sputum by Avery's method, or cultures obtained by lung puncture in 7 additional cases, showed 4 with Type II, and 3 with type IV pneumococcus. No blood culture was positive in 11 cases of bronchopneumonia examined. The pneumococcus was found only twice (one Type I and one Group IV) in sputum cultures in the 14 cases of bronchopneumonia. *B. influenzae* was found in large numbers in films from sputum in the bronchopneumonia cases, but only in a few cases of the lobar pneumonia groups.—L. W. F.

**313. *The Significance of Certain Pulmonary Lesions in Relation to the Etiology of Influenza.* E. W. GOODPASTER. Am. J. M. Sc., Phila., 1919, 158, 863-870.**

A discussion of the question of the etiology of influenza, the great variation in results of bacteriological analysis of the lungs and respiratory tract of those dead of influenza, and the absence of bacteriological evidence for a specific etiological agent producing the disease. Since there is no argument for any one microorganism as the etiological agent, attention is directed to the pathological anatomy of the disease, to gain possibly some positive knowledge concerning its doubtful cause. Characteristic lesions are produced in the lungs by an unknown virus, and not by any one of the numerous pathogenic microorganisms which have been cultivated from that source. The lesion consists of "a dilated condition of alveolar ducts, with a hyaline membrane partially or completely covering their walls and sometimes those of subtended alveoli." The lesion, which has also been described by others, is discussed in detail, and special case reports are given. In conclusion, the author states that "influenza is a distinct disease, recognizable clinically only by its epidemic proportions and extreme infectiousness, characterized pathologically by peculiar lesions in the lung, and caused by an unknown virus which gains entrance through the respiratory tract."—L. W. F.

**314. *Isolation of the Meningococcus from Cases of So-called Influenza.* R. KINNICUTT AND C. A. L. BINGER. Am. J. M. Sc., Phila., 1919, 158, 360-369.**

The authors report the results of bacteriological study of a series of cases occurring in two epidemics of so-called influenza, and some scattered cases admitted to the U. S. Base Hospital No. 6, Bordeaux, France. In their investigation, the best medium found for blood culture consisted of ascitic agar or coagulated blood medium slants in flat sided Pasteur tubes, to which was added dextrose infusion broth (0.4 per cent acid) until about one-quarter full. A coagulated sheep's blood medium was used for all other cultures which partially differentiated the colonies of the types of organisms present. It was prepared as follows: "Defibrinated sheep's blood, 2 or 3 parts, dextrose infusion broth (0.2 per cent to phenolphthalein), 1 part. The mixture is well shaken, slanted, inspissated, and sterilized by fractional sterilization in an Arnold sterilizer." The meningococcus grew well upon this medium and showed "as rather large, round, grey, shiny, flat colonies, with smooth edges." The Gram-negative diplococci isolated were tested for agglutination reactions with meningococcus serum types A, B, and C (French classification), as furnished by the Pasteur Institute, also in a few cases the polyvalent antimeningococcus serum from the Rockefeller Institute was used. The macroscopic method was used and carried out in a water bath at 37°C. The sera were used in dilutions 1 to 25 and 1 to 50, and controlled in normal human serum in dilution of 1 to 25. The bacteria were grown upon coagulated sheep's blood medium, and the pure culture was suspended in normal salt solution for the test. In one epidemic (Mimisan) Type C meningococcus was recovered by blood culture (dextrose broth) from 1 case 2 hours before death, and not from the lungs or heart's blood at autopsy. Nine other cultures gave negative results.

Of 10 dying from bronchopneumonia, the meningococcus was recovered from the lungs of 4 at autopsy, also 1 gave the organism from an acute suppurative otitis media. In the other epidemic (Le Courneau) of 25 nasopharyngeal cultures, 22 showed Gram-negative diplococcus, 14 of which were isolated in pure culture,—9 were agglutinated by the polyvalent antimeningococcus serum (Rockefeller Institute), and not by normal horse serum; 5 were not agglutinated by either serum. Of 4 specimens of sputum, all showed Gram-negative diplococci, 2 were isolated in pure culture, and both proved to belong to Type C meningococcus. Of 25 blood cultures taken in broth, all were negative for Gram-negative diplococci. Later 15 were taken on Pasteur tubes containing solid, slanted media as well as broth, of these 4 showed Gram-negative diplococci; 3 agglutinated with Type C serum, the other with no serum tested. The positive blood cultures were from cases which proved fatal (complicated with bronchopneumonia). The heart's blood was cultured 24 times, 4 showed Gram-negative diplococci; of the 3 tested 2 agglutinated with Type C serum, the other with none used. Cultures were made from lungs 22 times, 12 of which showed Gram-negative diplococci; 11 agglutinated with type C serum, while 1 agglutinated with none. The authors consider the meningococcus, as well as streptococci and pneumococci, as secondary invaders in "influenza."—L. W. F.

315. *Noma grippale. (Influenzal Noma.)* GEORGES PORTMANN. *Presse méd., Par.*, 1919, 27, 407.

A case of noma in an adult convalescent from influenza. The rôle of the previous infection is not established.—L. A. K.

316. *Contribution à l'étude des complications oculaires de la grippe. (A Contribution to the Study of Ocular Complications of Influenza.)* G. JOURNEAULT. Thesis, Univ. Paris. 1919. *Presse méd.*, 1919, 27, 550.

A variety of lesions is described. Their cause is less a toxemia than an infection; sinusitis proceeds to orbital or meningeal infections, with optic perineuritis. Pneumococci, streptococci, influenza bacilli and meningococci are found.—L. A. K.

317. *Untersuchungen über die Bakteriendichtigkeit der Grippeschutzmasken. (Investigation of the Penetration of Masks by Bacteria.)* A. LAUTERBURG. *Cor.-bl. f. schweiz. Aerzte*, Basel, 1919, 49, 1786-1804.

An account of experiments on the mechanical testing of the penetrability of masks for bacteria. The technic and results are presented in detail.—G. H. S.

318. *Comment on the Statistical Study of the So-Called Influenza Epidemic of 1918-1919.* OTTO R. EIGHEL. *Health News*, Albany, 1919, 14, 280-284.

A general discussion.—F. W. T.

319. *Influenza.* HERBERT FRENCH. *Guy's Hosp. Gaz., Lond.*, 1919, 33, 118-127.

The author states "that most infective diseases exhibit big waves of waxing and waning virulence, these waves sometimes extending over long periods of 10, 20, 30, or it may be 50 years." He feels that this accounts for the high virulence of the recent influenza epidemic, and that the influenza bacillus, starting the attack, is also responsible for its distribution. But, "pneumococci, streptococci, or pneumo-bacilli, which may have been already latent in the patient's mucous membranes, seem to have their virulence so much increased by symbiosis with the influenza bacilli that the actual influenza itself becomes entirely overshadowed by a virulent and generalized acute toxemia or septicemia due to pneumococci, streptococci, or pneumo-bacilli, as the case may be." In conjunction with Eyre the writer investigated the bacteriology of a peculiar type of pneumonia at Aldershot, before the present epidemic started, where double infections by the influenza bacillus and virulent cocci were found, results which were verified in the epidemic form of the disease by Eyre in and about Salisbury. Lung changes are not the only systemic changes found post-mortem,—hardly any organ of the body escapes damage,—the pneumonia is not of the true croupous type. Acute nephritis, with kidneys of the congested blood oozing type, was found in practically all the fatal cases. The patient apparently suffers from influenza-pneumococcal or influenza-streptococcal generalized toxemia, or actual septicemia. The infection is not confined to the lungs and respiratory passages. The various gross pathological changes found in the lungs are fully described. The clinical symptoms, prognosis, and treatment of the disease are fully discussed.—L. W. F.

320. *Das Verhalten der kutanen Tuberkulinreaktion während der Influenza (Spanische Grippe). (The Cutaneous Tuberculin Reaction during Influenza.)* ER. SCHIFF. *Monatschr. f. Kinderh., Leipz. & Wien*, 1918, 15, No. 3.

After influenza the anergic condition persists for 4 weeks and even longer. (Cor.-bl. f. schweiz. Aerzte.)—G. H. S.



## TUBERCULOSIS

(See also Numbers 67, 74, 370, 371, 372, 373, 374, 452, 453, 454)

321. *An Attempt to Test the Strength of Tuberculin by Cutaneous Injection.* WILHELMINE LÖWENSTEIN-BRILL. *Ztschr. exper. Med.*, 1918, 7, 103-107.

"The intracutaneous method can not be used to test the strength of tuberculin because of the trauma produced by the injection. By the method of v. Pirquet an increase in concentration by 10 produced a vesicle  $1\frac{1}{2}$  times as large. More exact quantitative tests were not possible." (Chem. Abstr.)—G. H. S.

322. *Die klinische und prognostische Bedeutung der Muchschen Formen des Tuberkelbazillus. (The Clinical and Prognostic Significance of Much's Form of the Tubercle Bacillus.)* GEZA GALL. *Beitr. z. Klin. d. Tuberk.*, Würsb., 1918, 39.

After a study of 68 patients with pulmonary tuberculosis the author divided them into the following three groups; (1) the sputum showed only normal tubercle bacilli, (2) both *B. tuberculosis* and Much granules were found, and (3) only the Much granules were present. It appeared that the prognosis was better in the second group, and decidedly better in the third group, than in the first. The author concludes that the formation of granules is an index of the reactive power of the body against the infection. (Cor.-bl. f. schweiz. Aerzte.)—G. H. S.

323. *Der biologische Nachweis aktiver Tuberkuloseherde des menschlichen Körpers durch die intrakutane Eigenharnreaktion. (The Biologic Recognition of Active Tuberculous Foci in Man by Means of the Intracutaneous Injection of Homologous Urine.)* DEBRÉ AND PARAF. *Schweis. med. Wchnschr.*, 1920, 1, 32.

Polemic against Windholz. A reply by Windholz is appended.—G. H. S.

324. *Ueber das Vorkommen von Tuberkelbazillen im Blut und im Urin bei Lungentuberkulösen. (The Presence of Tubercle Bacilli in the Blood and Urine of Patients with Pulmonary Tuberculosis.)* K. WEIERAUCH. *Beitr. z. Klin. d. Tuberk.*, Würsb., 1918, 39.

By animal inoculation with the blood of patients with pulmonary tuberculosis it was shown that in at least 2 out of the 27 cases examined *B. tuberculosis* was present. From one of the cases the urine also gave an infection. (Cor.-bl. f. schweiz. Aerzte.)—G. H. S.

325. *Immunobiologische Untersuchungen über Tuberkulosedisposition und Immunisierungsmechanismus. (Immunological Study of Predisposition to Tuberculosis and Immunizing Mechanisms.)* ALTSTAEDT. *Beitr. z. Klin. d. Tuberk.*, Würsb., 1918, 39.

Brothers and sisters, whether tuberculous or not, show the same immunity reactions in childhood. Among adults, brothers and sisters with active tuberculosis show qualitatively the same reactions. Adults with inactive tuberculosis show the usual immunity picture, independent of familial relationships. (Cor.-bl. f. schweiz. Aerzte.)—G. H. S.

326. *Beitrag zu der Lehre von der Vererbung eines locus minoris resistentiae bei der Lungentuberkulose. (Contribution to the Study of the Inheritance of a Locus Minoris Resistentiae in Pulmonary Tuberculosis.)* E. A. MAYER. *Ztschr. f. Tuberk.*, Leipz., 1918, 29.

A study was made of 291 individuals from 112 families. In three-fourths of the cases a uniformity of the initial point of infection was noted. In view of these findings, and those of others, it is considered that Mendel's law holds. (Cor.-bl. f. schweiz. Aerzte.)—G. H. S.

327. *Das Leukozytenbild bei Lungentuberkulösen. (The Leucocytic Picture in Pulmonary Tuberculosis.)* WEILL. *Ztschr. f. Tuberk.*, Leipz., 1918, 29.

From a diagnostic point of view a leucocytic formula in which the large and small lymphocytes show both a relative and an absolute increase is indicative of tuberculosis. With advancing severity of the disease a hyperleucocytosis occurs characterized by an increase in neutrophils. Polynuclear leucocytosis usually indicates secondary infection. (Cor.-bl. f. schweiz. Aerzte.)—G. H. S.

328. *Erfahrungen in der diagnostischen und therapeutischen Anwendung der Deycke-Muchschen Partialantigene bei der Lungentuberkulose. (The Diagnostic and Therapeutic Use of the Partial Antigen of Deycke and Much in Pulmonary Tuberculosis.)* ERICH GABBE. *München. med. Wchnschr.*, 1918, No. 50.

The author concludes that intracutaneous injections of the antigen in pulmonary tuberculosis are of no value either from a diagnostic or prognostic point of view nor as a control of therapy. In certain cases the antigen seems to influence the course of the disease favorably but from the study of 60 cases so treated nothing definite can be said. In certain cases the use of the antigen leads to focal reactions of some duration. Such reactions are not beneficial. (Cor.-bl. f. schweiz. Aerzte.)—G. H. S.

## DISEASES OF CHILDREN

(See also Numbers 70, 236, 349, 417, 440, 471)

**329.** *Contributo allo studio dell'immuno profilassi nella scarlatina.* (Contribution to the Study of Immune Prophylaxis in Scarletina.) L. CONCERTI. Policlin., Roma, 1919, 26, 1081.  
Deviation of complement was obtained by testing serum of scarlatina patients with an alcoholic extract of the desquamative tissue. A sero-vaccine was made which provoked specific antibodies in the subjects treated.—P. M.

**330.** *Körpergewicht und Resistenz der Kinder gegen Infekte.* (Body Weight and the Resistance of Children in Infections.) FRITZ STICKLER. Arch. f. Kinderh., Stuttg., 1918, 67, Nos. 1-2; Schweiz. med. Wchnschr., 1920, 1, 17.

Clinical observations on 200 cases of scarlet fever and on 500 cases of diphtheria indicate that the clinical course and the outcome of the infection was less severe in under- than in over-nourished children.—G. H. S.

**331.** *Epidemiologische Studien über Diphtherie.* (Epidemiological Studies on Diphtheria.) PETER M. HOLST. Centralbl. f. Bakteriol. (etc.), Jena. 1. Abt. Orig., 1919, 82, 412-421.  
Diphtheria is sporadic, sometimes epidemic in Norway. The study was made in order to throw some light on the origin and spread of such epidemics.

The content of diphtheria antitoxin in the blood of 100 individuals was determined by means of the Römer intracutaneous method. Twenty-nine of 31 individuals not sick with diphtheria had no antitoxin in the blood. In 19 cases of diphtheria no antitoxin appeared during the first 3 or 4 days of the disease. Small amounts were found in blood of severe cases that had been treated with large doses of antitoxin. In a series of carriers, 6 out of 13 showed antitoxin. Results in general do not conform to the contentions of Conradi. The author concludes that during any epidemic of diphtheria infection is so general that the people are for the most part immunized, even though only a small percentage shows the symptoms of the disease. Upon the decline of this resistance the way is open for a recurrence of the epidemic.—R. E. B.

**332.** *Control of Diphtheria by Cultures of the Noses and Throats of School Children.* L. B. GLOTNE. J. Am. M. Ass., Chicago, 1920, 74, 83.

Antitoxin has a definite place in giving immunity to diphtheria but does not destroy the germs. Carriers usually clear up entirely without the use of antitoxin. Two negative cultures should be required as the minimum from all children that have had a positive culture. Quarantine of carriers is essential. Swabbing of throats of children is an important measure when a single case occurs.—P. G. H.

**333.** *The Bacteriology of Mumps: Report of Findings at Camp Lee.* R. L. HADEN. Am. J. M. Sc., Phila., 1919, 158, 698-702.

A report of 5 cases of mumps from which a Gram-positive diplococcus was isolated from the following sources: Spinal fluid (1); blood (3); lymph gland (1). Twenty-five blood cultures were taken upon dextrose and plain infusion broth from 18 patients; 19 cultures were sterile, 2 contaminated, 4 (3 patients) showed the diplococcus. The organism grew very slowly in broth; transplants to blood agar plates showed very small dew-drop colonies without pigment production in 48 hours. It grew readily on all media after several transplants. A severe orchitis was produced in a rabbit 10 days after the injection of the organism in the testicle. Similar organisms have been reported from cases of mumps by previous investigators. The writer's findings tend to confirm those observations. He states that "mumps is probably caused by a Gram-positive diplococcus and not by a filterable virus."—L. W. F.

**334.** *Meningo-Encephalitis as the Only Manifestation of Mumps: Report of Three Cases.* T. HOWARD. Am. J. M. Sc., Phila., 1919, 158, 685-689.

Howard reports 3 cases occurring at Camp Lee among an epidemic of mumps "which exactly parallel the frank cerebral complication of mumps as observed at this hospital, except for the absence of involvement of the salivary glands or testes." In support of the clinical diagnosis in the cases reported, the author points out that mumps is a general infection, as metastatic lesions are well known, and at times the salivary glands are not involved. Clinical evidence is cited in favor of the diagnosis in the particular cases reported with the laboratory findings. A Gram-positive diplococcus was recovered in 2 of the 3 cases from the spinal fluid. The organism was grown in pure culture, as well as appearing in direct smear. It is believed by some investigators that mumps is due to an organism of that description.—L. W. F.

## DERMATOLOGY

(See also Number 486)

**335. Beitrag zur Aetiologie der Variola. (Contribution to the Etiology of Variola.)** HALLENBERGER. *Centralbl. f. Bakteriologie* (etc.), Jena. I. Abt. Orig., 1917, **80**, 89-105.

A microscopic study of the relationship of the Guarnieri granules and of the Paschen granules of variola to the disease. The various stages in the development of these granules are described and figured. Causal organism is probably the *Chlamydozoon variolo-vaccinae* v. Prowazek, renamed by the author *Stronglyoplasma variolae*. It is contended that the evidence of the causal relationship of this organism to the disease is very good.

Excellent colored plates give the cycle of changes in the development of the granules.—R. E. B.

**336. Favus herpeticus or Mouse Favus in Man.** R. E. BUCHANAN. *Pub. Health Rep.*, Wash., 1919, **34**, 319-320.

There is a possibility that those who handle imported Australian wheat may become infected with mouse favus or *Favus herpeticus* from the bags, dead mice, or possibly from the wheat itself. It is caused by the dermatophyte *Achorion quinckeanum*. A study at the Hygienic Laboratory of the United States Public Health Service of samples of wheat and of several mouse skins collected in Australia proved negative. The figures and descriptions given by Australian physicians leave no doubt that the disease is present in Australia. The infection in man is usually not serious, yielding readily to treatment. There are apparently no reports of cases in the United States in recent years.—C. E. T.

**337. Sycosis Barbae.** HENRY C. SEMON. *Practitioner*, Lond., 1920, **104**, 48-58.

Seborrhoeic sycosis, Barber's rash, (true coccogenic sycosis) tinea sycosis, lupoid and syphilitic sycosis and miscellaneous infections which may superficially simulate the sycoses are discussed. An interesting case is mentioned under the first heading in which the infection located in the depression between the lip and chin cleared up after the scaling and cleansing of the central and lateral incisors of the lower jaw.

A preponderance of cases occurs in patients who shave themselves. Examination of the yellow serum in the vesicopapules shows streptococci, later staphylococci predominate. No decided success has been obtained with vaccines. In tinea, cultural tests on Sabouraud's medium should be made; partial success has been obtained in Austria with "trichophytins."—C. P. B.

## FILTERABLE VIRUSES

**338. Trench Fever: A Summary from the Literature.** MAURICE BUCHHOLTZ. *Pub. Health Rep.*, Wash., 1919, **34**, 677-681.

## Summary

(1) The whole blood from febrile cases of trench fever up to the 51st day of the disease, when injected intravenously, is capable of producing the disease. The incubation period in such cases varies from 5 to 20 days. (2) The bites alone of infective lice appear not to produce trench fever, but the excreta of infective lice when applied to a broken surface of skin do readily produce it. The incubation period in such infections averages 7 days. (3) It takes at least 7 days from the time the louse has fed on trench fever blood for the excreta to become infective, thus indicating either a developmental cycle in the louse or a period during which the organism multiplies. (4) The lice remain infective for at least 23 days. (5) The virus is destroyed by heating to 80°C. for 10 minutes—a fact which indicates that it is not a spore-bearing organism. (6) Such immunity as results from an attack of trench fever is very transient. (7) A patient's blood may be capable of infecting mice as late as the 79th day of the disease. (8) Prophylactic measures must concern themselves chiefly with delousing of infested persons.—C. E. T.

## SURGICAL BACTERIOLOGY

(See also Numbers 65, 422, 441)

**339. A Quantitative Study of Wound Healing in the Rat. I. Cell Movements and Cell Layers During Wound Healing.** HACHIRO AKAIWA. *J. Med. Research*, Bost., 1919, **40**, 311-351.

Wound healing leading to the closure of the wound depends upon three factors; (1) epithelial movements, (2) cell proliferation, and (3) contraction of the wound. The larger the wound, the more intense is its stimulating effect upon the epithelium and the more rapid are the movements of cells covering the defect. Larger wounds close, therefore, more rapidly than smaller wounds. The more shallow the wound the more easily the epithelium moves over the defect owing to the character of the surface which is favorable to the movements of cells. Shallow wounds close, therefore, more quickly than the deeper ones.

The epithelial movements occur not only in the cells which advance over the defect, but also in the neighboring epithelium, and the movement is directed towards the center of the wound. The epithelial movements represent the first response of the tissue to the wound stimulation and secondarily these movements soon call forth cell proliferation and cell growth, first in the old epithelium and later in both the new and old epithelium.—A. C. E.

**340. A Quantitative Study in Wound Healing in the Rat. II. Cell Growth During Wound Healing.** HACHIRO AKAIWA. J. Med. Research, Bost., 1919, 40, 371-413.

The proliferative power of the epithelium may be determined by counting the mitoses and the number of living cells in the defect as well as in the tissue adjoining the defect.

The mitotic proliferation in the outgrowing epithelium shows in most cases a sharp rise in the period following the first three and a half days, and a maximum is reached at the time of the closure of the wound; the number of mitoses remains often high for 1 or 2 days following the closure, and only then a sudden decline in the number of mitoses takes place, while again a much slower diminution in the number of cells occurs; in other cases the closure of the wound is directly followed by a sharp fall in the number of mitoses. As long as even a very small part of the wound is still uncovered by epithelium, the number of mitoses is invariably high.

Changes take place also in the number of mitoses in the old epithelium. However, in both the outgrowing and the old epithelium the mitotic proliferation returns, as a rule, almost to the normal condition about 14 days after the operation.

The variations in the size of the epithelial cells and of nuclei are as a rule concordant with the variations in the proliferative activity and in the rapidity of movement of the cells. The form of the basal cell also differs in the different periods of wound healing. The variations in the number of cell rows and in the thickness of the stratum germinativum are likewise as a rule concordant with the variations in the proliferative activity as well as in the energy of cell movements and with the resulting variations in the size of cells.

The curve representing the changes in size of cells and nuclei declines in both the new and the old epithelium much more slowly than the curve representing the number of mitoses.—A. C. E.

**341. Heat-Resistant Organisms. A Study of Bacteria Encountered in Heat Sterilization of Surgical Ligatures and Sutures.** FREDERIC FENGER, ELOISE B. CRAM AND PAUL RUDNICK. J. Am. M. Ass., Chicago, 1920, 74, 24.

Five types of heat-resisting bacteria were isolated from ligatures and sutures. Two were cocci and three bacilli. None were pathogenic for mice, guinea pigs and rabbits. Plain and chromicized ligatures can be sterilized only by heat. Absolute sterility is assured by gradually heating the ligatures in oil or some other suitable nonaqueous liquid to 160°C. and holding at this temperature for 1 hour. The thermal deathpoint for the five types of bacteria described lies between 150° and 160°C. under the conditions found in ligatures and nonaqueous liquids.—P. G. H.

**342. Un cas de gangrène gazeuse toxique à *B. perfringens*. (A Case of Toxic Gaseous Gangrene Due to *B. perfringens*.)** TH. CHAPIN BEEBE. Compt. rend. Soc. de biol., Par., 1919, 82, 992.

A case report.—G. H. S.

**343. Sur la présence d'histamine dans les muscles atteints de gangrène gazeuse. (The Presence of Histamine in Muscles which had been the Seat of Gaseous Gangrene.)** EDGARD ZUNZ. Compt. rend. Soc. de Biol., Par., 1919, 82, 1078.

An analysis of muscles which had been amputated because of gas gangrene infection showed the presence of  $\beta$ -imidazoylethylamine.—G. H. S.

**344. La suture secondaire des poches abcédées et des plaies suppurées après désinfection par le liquide de Dakin. (Secondary Suture of Abscess Pockets and Suppurating Wounds after Disinfection with Dakin's Solution.)** BERGERET AND GALVEZ. Presse méd., Par., 1919, 27, 655.

Warm abscesses and suppurating cavities may be successfully sutured after intermittent Carrel-Dakin irrigation.—L. A. K.

**345. The Disinfection of Vitalized Tissues and the Healing of Wounds with Chinisol and Salt.** W. C. LUSK. Proc. Soc. Exper. Biol. & Med., N. Y., 1919, 16, 104-110.

Lusk states that chinisol (oxyquinolinsulphate) *in vitro* is a powerful antiseptic, but exerts very little germicidal action. *Staphylococcus aureus* was not killed in 24 hours by a 2 per cent solution. He assumes that its disinfectant action on vital tissues may be "due to the excitement by it of physiological stimuli to bring nature's forces of resistance to the fore." The writer's studies were made by combining salt with chinisol in the treatment of wounds. The experimental data are given including both clinical application to surgical cases, and experimental work on animals. Methods of treatment, the various combinations used, and the results obtained, are described. Its merits as a tissue disinfectant in surgical conditions are discussed by the author.—L. W. F.

346. *Sur les propriétés germinatives des streptocoques de plaies.* (The Germinative Power of Wound Streptococci.) LE FÈVRE DE ARRIC. *Compt. rend. Soc. de biol., Par.*, 1919, 82, 946.

Strains of streptococci differ greatly in the rapidity with which they multiply. Streptococci from wounds of some duration grow less rapidly than strains isolated early. There thus appears to be a diminution in the capacity of the ability to proliferate during its evolution in the wound.—G. H. S.

347. *Sur la culture des streptocoques homologues dans le sérum des blessés porteurs.* (The Cultivation of Streptococci in the Serum of Patients from whose Wounds they were Isolated.) LE FÈVRE DE ARRIC. *Compt. rend. Soc. de biol., Par.*, 1919, 82, 948.

Usually the streptococci isolated from a wound are able to grow with greater rapidity in the serum of normal individuals than in the serum of the wounded person.—G. H. S.

348. *Sur la culture des streptocoques homologues dans le sérum des blessés porteurs.* (The Culture of the Streptococcus in the Serum of the Individual from whom it was Isolated.) LE FÈVRE DE ARRIC. *Compt. Rend. Soc. de biol., Par.*, 1919, 82, 1066.

But little is added to the data already presented by the author on the subject.—G. H. S.

## SEROLOGY

(See also Numbers 63, 253, 325, 329)

349. *Studien über die normale Diphtherieimmunität des Menschen. IV. Mitteilung. Die normale Diphtherieimmunität im Kindesalter.* (Studies of Normal Diphtheria-Immunity in Man. Part IV. Normal Immunity to Diphtheria in Childhood.) F. v. GRÖER AND K. KASSOWITZ. *Ztschr. f. Immunitätsforsch. u. exper. Therap., Jena*, 1919, 22, 327-367.

A report of the study of Schick reactions and reactions to toxin-antitoxin mixtures, in 1062 children, whose ages were from birth to 18 years. The children were cases in various hospitals. Some were normal, others were suffering from various diseases. A continuous curve for diphtheria-immunity for all ages within these limits has been constructed from the data, which shows:

*Percentage of children with immunity to diphtheria (negative Schick reaction)*

	per cent immune
At birth . . . . .	86
At 1 year . . . . .	32
At 2 years . . . . .	32
At 3 years . . . . .	28
At 4 years . . . . .	48
At 5 years . . . . .	45
At 6 years . . . . .	45
At 7 years . . . . .	38
At 8 years . . . . .	58
At 9 years . . . . .	56
At 10 years . . . . .	58
At 11 years . . . . .	65
At 12 years . . . . .	55
At 13 years . . . . .	55
At 14 years . . . . .	68
At 15 years . . . . .	75
At 16 years . . . . .	80
At 17 years . . . . .	82
At 18 years . . . . .	85

These figures show 85 per cent of children at birth have some immunity to diphtheria. The curve falls after the first year, rises again about the time of puberty and reaches a second maximum of 85 per cent of immunes at the 18th year.

Theoretical analysis of the curve indicates that three factors are operative in this incidence of normal immunity: (1) Passive diaplacental immunity of the new-born, which is gradually lost during the first year of life. Children fed on the bottle lose this passive immunity more rapidly than breast-fed children. (2) "Autochthonous" formation of antitoxin by the child itself. This begins about the 13th year and seems to be a function of serum changes associated with puberty. (3) Active immunization.—S. B-J.

350. *The Incidence of Syphilis as Manifested by Routine Wassermann Reactions on 2925 Hospital and Dispensary Medical Cases.* ANTHONY B. DAY AND WILLA McNITT. *Am. J. Syphilis*, 1919, 3, 605.

Two thousand nine hundred twenty-five hospital and dispensary patients were subjected to routine Wassermann test during the year 1918.

The incidence of syphilis as shown by the Wassermann reaction was lowest among the well-to-do, about twice as high among the middle class, represented by the pay-ward patients, and about three times as high among the lower social class, or free-ward patients. The incidence of syphilis among colored patients was about six times that among private patients.

About 15 per cent of cases giving strongly positive reactions gave no clinical evidence of syphilis. This percentage increases with the cholesterin positive cases, indicating that a certain number of cases giving weakly positive reactions with cholesterin antigen only did not have syphilis. Therefore weak reactions with the cholesterinized antigen are of value only when there is a definite clinical evidence of syphilis, in treated cases or in cases of neuro-syphilis.

Of 7 cases of diabetes giving positive Wassermann reactions, only one did not have clinical evidence of syphilis; of 4 cases of malaria giving positive Wassermann reactions it seems probable that 2 of the positive reactions were due to malarial infection and not to syphilis.—C. P. B.

**351. Die Brucksche und Wassermannsche Reaktion in den einzelnen Stadien der Syphilis und unter dem Einfluss der Behandlung.** (*The Bruck and Wassermann Reaction in the Various Stages of Syphilis and Under the Influence of Treatment.*) W. GÄRTNER. *Centralbl. f. Bakteriol.* (etc.), Jena. I. Abt. Orig., 1918, 82, 337-383.

The author records and discusses a large number of blood reactions of cases of syphilis in different stages using both the Wassermann test and the Bruck test. The latter is made by adding to 0.5 cc. blood serum, 2 cc. distilled water and 0.3 cc. of 25 per cent nitric acid. This mixture will show a precipitate. This is added to 16 cc. of water.

The precipitate from normal blood dissolves completely, but a permanent precipitate remains with syphilitic blood.

In general, comparative studies showed both Wassermann and Bruck tests to be negative in the early primary stage, Wassermann weak to strong positive, Bruck negative and later positive in the late primary stage, both 100 per cent positive in the early (exanthema) secondary stage, Wassermann positive and Bruck either positive or negative in the late secondary. In the early latent stage the Wassermann is usually positive, the Bruck likewise but with more exceptions. In later stages the Wassermann test is either negative or positive, the Bruck reaction usually negative.

The reaction is not specific for syphilis. Cases of *ulcus molle* with negative Wassermann were negative to the Bruck reaction, except when severe and accompanied by buboes, whereupon the Bruck test became positive. Tubercular patients are generally Bruck positive, as are a considerable portion of those with skin diseases but having negative Wassermann.

A comparison of the Klausner, Bruck, and Wassermann tests is given for a series of patients.—R. E. B.

**352. Delaying the Early Diagnosis of Syphilis (Chancres): The Dangers and how to Avoid Them.** E. WILLIAM ABRAMOWITZ. *Am. J. Syphilis*, 1919, 3, 607-612.

It is not necessary to wait for the appearance of a positive Wassermann before treatment is instituted, as a positive dark-field is sufficient evidence of the presence of lues. The danger in delaying the diagnosis is the dissemination of the *Spirocheta pallida* throughout the tissues, necessitating prolonged treatment in some cases, with the possibility of relapses in vital structures. The chancre-Wassermann negative cases are considered preeminently favorable for a permanent cure.—C. P. B.

**353. Syphilis among the Insane with Special Reference to the Hecht-Weinberg-Gradwohl Test.** THOMAS B. CHRISTIAN. *Am. J. Syphilis*, 1919, 3, 613-626.

The Hecht-Weinberg-Gradwohl test has been a better control of the Wassermann than any of the other controls in use. All cases that showed a doubtful Wassermann reaction were cleared up by repetition of the test and using the Hecht-Weinberg-Gradwohl method. Eleven cases diagnosed clinically as syphilis gave Wassermann and Hecht-Weinberg-Gradwohl both negative; 8 gave positive Wassermann with negative Hecht-Weinberg-Gradwohl; 7 gave negative Wassermann and four-plus Hecht-Weinberg-Gradwohl from which syphilis could be excluded. Among the paretics of this series the Hecht-Weinberg-Gradwohl was positive in 98.5 per cent of the cases and the Wassermann was positive in 97.01 per cent of the cases.—C. P. B.

**354. Séro-diagnostic de la syphilis—Les erreurs de technique dans la réaction de Hecht (serum non chauffé) et leurs causes.** (*The Serum Diagnosis of Syphilis. Technical Errors in the Hecht Reaction (Unheated Serum) and their Causes.*) RUBINSTEIN. *Presse méd.*, Par., 1919, 27, 373.

The Hecht reaction, while sometimes positive in non-luetic patients, has great value in conjunction with the Wassermann test. Alcoholic extract antigens suitable for the Wassermann reaction may usually be used for the Hecht test in higher dilution. The antigen must be proved not to interfere with the normal hemolysis of the negative sera. The varying content of complement and hemolysin of human serum is best compensated for by using increasing doses of red blood cells.—L. A. K.

355. *L'antigène syphilitique de l'Institut Pasteur de Bruxelles. (Syphilitic Antigens as Prepared at the Pasteur Institute of Bruxelles.)* J. BORDET AND G. RUELENS. *Compt. rend. Soc. de biol., Par., 1919, 82, 880.*

The technic for the preparation of antigen for the Wassermann reaction is presented. It differs only in minor details from methods already published.—G. H. S.

356. *De l'utilisation systématique des antigènes multiples dans la réaction de Bordet-Wassermann. (The Systematic Use of Multiple Antigens in the Wassermann Reaction.)* A. RANQUE, CH. SENEZ AND A. DAUFRESNE. *Compt. rend. Soc. de biol., Par., 1919, 82, 1294.*

A statistical study based on the use of 4 antigens with 500 serums. In the 500 examinations there were 17 discordant results, 14 of which were of the nature of false positives.—G. H. S.

357. *Le diagnostic de la syphilis par le procédé de Sachs-Georgi. (The Diagnosis of Syphilis by the Method of Sachs-Georgi.)* B. GALLI-VALERIO. *Cor.-bl. f. schweiz. Aerzte., Basel, 1919, 49, 1977-1980.*

The technic for the preparation of antigen, for conducting the reaction, and for reading the results is given. A collective review of work conducted by the reaction in conjunction with the Wassermann reaction is followed by a statement of the results secured by the author in the examination of 241 sera.

The author concludes that with some perfection in the technic of antigen preparation and manipulation of the reaction the results will become more and more exact, and that finally, because of its simplicity it will replace the Wassermann reaction.—G. H. S.

358. *Sérum frais et sérum inactivé dans le séro-diagnostic de la syphilis. (Fresh and Inactivated Sera in the Diagnosis of Syphilis.)* NICOLAU AND BETTANCOURT. *Compt. rend. Soc. de biol., Par., 1919, 82, 811.*

Comparative studies of the Wassermann reaction and the Hecht-Weinberg-Gradwohl modification of the reaction were made on 1400 sera. Concordant results were secured in 74.8 per cent of the sera, the Wassermann reaction was more sensitive in 6.5 per cent, and the modified reaction in 18.6 per cent. In 4.7 per cent the reaction could not be performed with the active serum since sheep hemolysins were entirely lacking. The simultaneous use of both methods is advised, the one serving as a check on the other.—G. H. S.

359. *Qu'est la séro-réaction de la syphilis? (What is the Serum Reaction in Syphilis?)* ARTHUR VERNES. *Presse méd., Par., 1919, 27, 333.*

An interpretation of the Wassermann reaction in terms of the author's flocculation theory. The flocculating power of human serum is increased in syphilis. It is this quality of the serum, which, acting as colloidal antigen, inhibits the hemolytic action of guinea pig complement (which is reinforced, in most modifications of the test, by the addition of hemolytic amboceptor), and gives the inhibition of hemolysis termed the positive Wassermann reaction.—L. A. K.

360. *Les porteurs de ténias. Réactions spécifiques. Réactions syphilitiques. (Specific Reactions and Syphilitic Reactions in Carriers of Tenia.)* H. VIOLLE AND L. DE SAINT-RAT. *Compt. rend. Soc. de biol., Par., 1919, 82, 1033.*

An antigen was prepared from tenia by lipid extraction. Fixation tests gave the following results:

1. The sera from individuals infected with tenia and not syphilitic gave negative reactions with the tenia antigen.
2. The sera from syphilitic individuals gave positive reactions with the tenia antigens.
3. The sera from individuals free from either infection gave negative reactions.
4. Identical reactions were secured in all cases where either the tenia or the syphilitic antigen was employed.

From these facts it is concluded that both lipid antigens act alike as syphilitic antigens. This indicates a non-specificity of the syphilitic antigen. Also that no specific antibody is present in individuals infected with tenia.—G. H. S.

361. *Ueber heterogenetische Antigene und Antikörper. VI. Mitteilung. Beiträge zur Natur des heterogenetischen Antigens gegen Hammelblut für Kaninchen im Pferdeharn. (Heterogenetic Antigens and Antibodies. Part VI. Investigation of the Nature of the Heterogenetic Antigen for Sheep Cells Produced by Injecting Rabbits with Horse Urine.)* E. FREIDBERGER AND K. SUTO. *Ztschr. f. Immunitätsforsch. u. exper. Therap., Jena, 1919, 23, 217-236.*

In 1911, Forssmann discovered that rabbits injected parenterally with emulsions of liver, kidney, adrenal, testis and brain of guinea pig developed a hemolysin for sheep red corpuscles. Freidberger considers this discovery to be of fundamental importance, and suggests the term "heterogenetic" antibodies for the immune substances which acts upon other antigens than the one used in the immunization of the animal. Contrasted with these are the "isogenetic" antibodies of Bordet, which are specific only for the antigen injected.

Forssmann's work has been extended by himself and others, who found that rabbits immunized with the proteins from kidneys of the horse and cat developed hemolysins for sheep cells. These heterogenetic antibodies are similar to those studied by Doerr and Pick, using heated proteins as antigens.

This paper reports studies on the hemolytic amboceptor for sheep cells produced by immunising rabbit with normal horse urine. Rabbits were injected intravenously with 15 cc. of horse urine, 6 times, at intervals of 7 days. The urine was considered to be free from protein, as the potassium ferricyanide-acetic acid, Heller's and Esbach's tests were negative, and to be free from sugar, as Trommer's and Nylander's tests were negative. The specific gravity of the urine at 17.5°C. was 1025; reaction was weakly alkaline to litmus. The serum of the rabbit, after a series of injections of urine, was tested for its hemolytic action upon 5 per cent suspensions of sheep red cells, using 0.1 cc. of fresh guinea pig serum as complement. An active, thermostabile hemolysin was found in the serum of the immunized rabbit.

Horse urine was submitted to fractional treatment with absolute alcohol, phosphotungstic acid and colloidal iron chloride in an attempt to obtain the antigen in pure state. The fraction of substances insoluble in absolute alcohol possessed no antigenic properties, while the alcohol-soluble fraction stimulated the production of anti-sheep hemolysin when injected into rabbits. The filtrate of the alcohol soluble fraction after treatment with phosphotungstic acid contained the antigen.—S. B-J.

362. *Ueber heterogenetische Antigene und Antikörper. VII. Mitteilung. Heterogenetische Präzipitine. (Heterogenetic Antigens and Antibodies. Part VII. Heterogenetic Precipitins.)* E. FRIEDBERGER *Ztschr. f. Immunitätsforsch. u. exper. Therap.*, Jena, 1919, 23, 237-245.

Studies on the formation of precipitin for sheep serum in animals immunized with proteins from horse and swine are reported, in continuation of previous work on heterogenetic antigens and antibodies. The results of these experiments are similar to those in which it was found that rabbits immunized with extracts of the organs and urine of horse and guinea pig developed a hemolysin for sheep cells.

The precipitin for sheep blood-protein produced by injections of heterogenetic antigens reacts also with proteins from other animals. Probably this is the general "mammalian reaction" described by Nuttall.—S. B-J.

363. *Some Experiments Dealing with the Question whether Lipoids Can Act as Antigens.* CHUNG YIK WANG. *J. Path. & Bacteriol.*, 1919, 22, 224-228.

The antigenic substances were prepared from egg-white, washed ox blood corpuscles and horse serum as follows: The respective substances were thoroughly dried *in vacuo* over  $H_2SO_4$ , ground to a fine powder and then extracted with ether by shaking 10 grams of the powder in 100 cc. of ether for 2 hours. The supernatant fluid was removed and centrifuged at very high speed for 20 minutes, any deposit being returned to the residue. The residue was now extracted with chloroform, 2 volumes of ether being added before the supernatant fluid was removed. The extraction was continued, using ether and chloroform alternately, until 5 extractions had been made. All the extracts were put together, the mixture being perfectly clear. The residue was allowed to dry after the extraction was completed. The extract mixture was stored in the dark at room temperature and prepared for use by allowing an amount constituting one dose to dry at 37°C. over night, saponifying the residue with a few drops of decinormal NaOH and finally emulsifying it in saline.

Rabbits were given a series of injections of the respective extracts and residues. The egg-white and horse extracts did not give rise to antibody formation, while their residues produced complement-fixing antibodies. The ox blood corpuscles extract gave rise to specific hemolysins and to complement-fixing substances. The residue also engendered specific hemolysins.—C. G. B.

364. *Die Lipoidbindungsreaktion. (The Lipoid-Fixation Reaction.)* E. MEINICKE. *Ztschr. f. Immunitätsforsch. u. exper. Therap.*, Jena, 1919, 23, 280-326.

The first part of this article gives an account of the author's attempts to differentiate between precipitates of globulin and precipitates of lipoids by means of dyes. Sudan 4, added to lipid emulsions will be carried out of solution when the lipid is precipitated. Protein stains will be partially carried down with a precipitate of globulin. This method, however, did not give sufficiently constant results when applied to sera to make it useful as a differential test between positive and negative syphilitic sera. The colloids of serum have a strongly protective action upon these combinations of dye and lipid.

A preparation of extract lipoids, according to the author's method described in a previous paper, forms a combination with serum-globulin, which results in a precipitation. This precipitation will occur with positive or negative sera, or other antigen-antibody combinations, according to the method used in the test. The three modifications of the reaction are given as:

1. Water-method: 0.2 cc. serum inactivated by 1 hour at 56°C., with 1.5 cc. of a 1-12 dilution of the lipid extract is placed for 1 hour in the incubator. Then 2.5 cc. of distilled water are added, and precipitation allowed to occur over night. Only the negative sera give a precipitation.

2. Sodium chloride method: 0.2 cc. of serum inactivated for  $\frac{1}{2}$  hour, with 0.8 cc. of a 1-8 dilution of the lipid extract are placed in the incubator over night, to allow precipitation to occur. The precipitate is tested for its solubility in salt solution. Both positive and negative sera give a precipitate, but the negative serum precipitate is soluble in physiological salt solution, while the precipitate from a positive serum is insoluble.



3. Third modification: 0.3 cc. of serum inactivated for  $\frac{1}{2}$  hour, with 0.3 cc. of 10 per cent solution of NaCl and 0.6 cc. of a 1-8 dilution of the lipid extract are allowed to stand in a test tube over night. Only the positive sera give a precipitate with this test.

The controls necessary for this series of tests are similar mixtures with normal serum and a test of the lipid extract with salt solution.

The author thinks that the mechanism of the reaction is a disturbance of sodium chloride equilibrium of the serum globulin, in the sense that the lipid extract removes sodium chloride from its association with globulin. This disturbance of salt equilibrium of globulin occurs more intensely with positive than with negative sera.

The paper contains a theoretical discussion of the significance of this lipid fixation reaction in the processes of immunity.—S. B-J.

365. *Action of Acids and Alkalies upon the Thermostable Components of Complement.* A. AZZI. Arch. di fisiol., Firenze, 1918, 16, 95-105.

The three components of complement are differently sensitive to the action of acids and alkalies. The most sensitive is that bound to the globulins; less sensitive is that bound to the albumins; and still less sensitive is that (third serum component) which is thermostable and sensitive to cobra venom. (Physiol. Abstr.)—G. H. S.

366. *A Study of the Thermolabile and Thermostable Antilynsins (Anticomplementary Substances) of Human Serum.* TAKAATSU KYOTOKU. J. Immunol., Balt., 1919, 4, 239-274.

Two antilynsins (thermolabile and thermostable) may be encountered in working with human serum as shown by the following facts: Ten human sera collected without special precautions and kept for 5 days at room temperature were anticomplementary before heating; after heating at 56°C. for 30 minutes none were anticomplementary. Heating human sera for 30 minutes at 60°C., 70°C., 80°C., and 90°C. have developed no antilynsins as described by Noguchi and Kolmer for the sera of dog, rabbit, ox and sheep. Thermostable anticomplementary substances resist heating at 50°C. for 2 hours as shown by 4 sera and may not be entirely removed by heating at 60°C. for 30 minutes as shown by 12 sera.

The writer shows in a series of tests that sterile broth and egg albumin do not develop anticomplementary substances, while sterile human sera do develop such substances. Serum dried on filter paper did not become anticomplementary.

Sera incubated 10 days with *Staphylococcus albus*, *B. coli*, *B. typhosus* and *B. subtilis* developed both thermolabile and thermostable anticomplementary substances. Plain neutral broth after 3 days' incubation with *Staphylococcus albus* became highly anticomplementary especially when unheated. The removal of cocci from serum and broth by porcelain filtration removed the anticomplementary properties of both. Tests on sera in which large amounts of hemoglobin were present showed that such sera, even when sterile, contained thermostable and thermolabile anticomplementary substances.

Sterile and contaminated sera containing antilynsins gradually become alkaline in reaction. The antilytic activities, however, are not removed by the addition of hydrochloric acid. Changes in the hydrogen ion concentration before and after the development of antilynsins in both sterile and contaminated serum, could not be determined with colorimetric methods. Refractometric studies of anticomplementary sera did not lead to very definite conclusions owing to variations in the amounts of albumin and globulin in the different sera. Extraction with ether did not remove the thermolabile and thermostable antilynsins contrary to what Noguchi found for dog, ox and sheep serum. Antilynsins are removed, both thermostable and thermolabile in part, from human serum by absorption with barium sulfate, kaolin, bone ash and charcoal but not with washed corpuscles. Antilynsins are also removed from human serum by filtration through Kitasato filters and with lueitic serum the antibody concerned in the Wassermann reaction is not affected.—R. R. H.

367. *On the Protection against the Action of Ultraviolet Light Afforded to Alexin and Sensitizer by Certain Substances.* FLORENCE MCCOY HILL AND PAUL L. A. SCHMIDT. J. Infect. Dis., Chicago, 1919, 25, 335-340.

The purpose of this investigation was a more detailed study than had been made previously of the protective action of aromatic substances against the toxic action of ultraviolet light. A Cooper-Hewitt Type Z quartz mercury arc lamp was used as the source of ultraviolet light, and the aromatic substances to be tested were placed in beakers over trays containing solutions of sensitizer and of alexin, the trays being protected from all ultraviolet rays except such as passed through the aromatic substances.

It was found that, although the unit of sensitizer is more easily destroyed by exposure to ultraviolet light than the unit of alexin, the difference is not real, since the concentration of serum proteins in the rabbit sensitizer and the guinea pig alexin differ widely. In equivalent dilutions an exposure of 1 hour is required to destroy sensitizer, while alexin is destroyed in 5 minutes, as shown by subsequent hemolysin experiments.

The aromatic amino-acids, tyrosin and phenylalanin, proteins containing these amino acids and certain substances belonging to the aromatic series showed marked protective action for alexin and sensitizer against the action of ultraviolet rays.

Since destruction can not occur without absorption the possibility is suggested that the difference in susceptibility shown by alexin and sensitizer toward ultraviolet light is due to a difference in aromatic amino-acid content.—I. W. F.

368. *Complement Fixation with Acid-Fast Bacteria. I. A Study of Various Organisms with Immune Rabbit Serum.* J. V. COOKE. J. Infect. Dis., Chicago, 1919, 25, 452-473.

Rabbits were immunized with strains of *B. leprae* (Duval, chromogenic and non-chromogenic, Bayon, Brinkerhoff, Kedrowsky, Clegg, Levy and Karlinsky), *B. tuberculosis*, human and bovine types, *B. smegmatis*, butter bacillus (Rabinowitch), dung bacillus (Moeller) and *B. lombardo pelegriano* (a pigmented saprophyte).

Antigens were prepared from these acid-fast organisms by grinding the dried bacteria in an agate mortar. The bacterial powder thus obtained was used in weighed amounts to immunize rabbits and as the antigen in the tests for complement fixation.

The hemolytic system consisted of rabbit antiserum, 1 and 5 per cent suspensions of sheep red corpuscles, and fresh guinea pig serum as complement. A considerable amount of work was devoted to the perfection of a delicate hemolytic system that would detect the least differences between the various organisms used as antigens in the experiments.

Tests on numerous combinations of the various immune sera and acid-fast organisms showed that in such immune sera there is present a complement fixing antibody which reacts with all members of the acid-fast group examined. By titration to determine the quantities of various antibodies present in these sera, it is possible to show that certain members of the acid-fast group have a close antigenic relationship. But cross-fixation, as for instance between *B. leprae*, *B. tuberculosis* and their respective anti-sera, are almost universally obtained with this group of bacteria. The reaction is specific only for the group, and may be called an "acid-fast fixation."—S. B.-J.

369. *Complement Fixation with Acid-Fast Bacteria. II. In Leprosy.* J. V. COOKE. J. Infect. Dis., Chicago, 1919, 25, 474-492.

The first section of this paper is the analysis of the findings of 42 investigators who have studied the Wassermann reaction in cases of leprosy. Half of the cases of leprosy so studied (1397 cases), gave a positive Wassermann reaction. As there is no clinical evidence that the incidence of syphilis among lepers is as high as this, and as the fixation of complement in the Wassermann reaction is admittedly a nonspecific lipoidal reaction, it is concluded that the Hansen bacillus may cause the appearance in the blood of substances giving a positive Wassermann reaction. This opinion is confirmed in the experiments reported in the second section of the paper, in which it was found that the sera of rabbits immunized to *B. leprae* and other acid-fast organisms fixed complement in the presence of the usual lipoidal Wassermann antigen.

Sera from cases of leprosy were used in complement fixation tests with other acid-fast organisms than the leprosy bacillus as antigens. When the leper serum had a high binding titer, non-specific fixations were obtained with antigens made from tubercle bacilli and other acid-fast bacteria. These cross fixations, the "acid-fast reactions" given by leper serum with acid-fast bacterial antigens prevent the use of the complement-fixation reaction in obtaining evidence of the etiologic importance of any acid-fast organism isolated from leprosy.—S. B.-J.

370. *Complement Fixation with Acid-fast Bacteria, III. In Tuberculosis.* J. V. COOKE. J. Infect. Dis., Chicago, 1919, 25, 493-500.

Nine strains of acid-fast bacteria from leprosy, two strains of *B. tuberculosis* (human and bovine), *B. smegmatis*, the acid-fast bacillus of butter, a diphtheroid organism and a lipoidal extract of heart muscle were used as antigens in complement fixation tests with sera from persons with tuberculosis. A specially delicate sheep-cell hemolytic system was used and titrations of the fixing power of various sera were made.

The results of the reactions confirmed the experience described in previous papers, namely, that an immune serum to one acid-fast organism will bind complement when any other acid-fast organism is used as the antigen and at certain titers when the lipoidal Wassermann antigen is used in the test.

The titrations showed that antibodies for various acid-fast bacteria were present in different concentrations in the sera from tuberculous patients, but that the differences did not correspond with the severity of the infection. In tuberculosis, the complement fixation test is of some value in calling attention to unrecognized cases, but does not always indicate a clinically active tuberculous disease.—S. B.-J.

371. *Etude comparée des faits cliniques et de la réaction de fixation dans la tuberculose avec les antigènes de Calmette et Massol. (Comparative Study of Clinical Condition and Complement Fixation in Tuberculosis, with Calmette's and Massol's Antigens.)* L. BOEZ AND E. DUHOT. Presse méd., Par., 1919, 27, 543.

Using these and Bearedka's antigen, the authors studied the reaction in 141 tuberculous and 60 non-tuberculous individuals. With C. and M. antigen, 77.9 per cent of pulmonary cases were positive: First period, 77.77 per cent; second period, 82.05 per cent; third period, 63.6 per cent; surgical types, 63.6 per cent; 7 healthy subjects, 0 per cent; non-syphilitic, non-tuberculous sick, 7.69 per cent.

In syphilis, as high as 60 per cent false positives may be obtained. The reaction curve resembles one of infection rather than immunity, but the absence of a reaction in severe cases has a grave prognostic import. Details of technic are to be found in the original paper.—L. A. K.

372. *Complement Fixation Test for Tuberculosis.* J. STUART PRITCHARD AND C. E. RODERICK. J. Am. M. Ass., Chicago, 1919, 73, 1879.

Complement fixation tests were made as aids in diagnosis, not as a control of treatment. Complement fixation is not so reliable for tuberculosis as the Wassermann test is for syphilis. The results warrant the conclusion that the test is of value as a control procedure. There was no tendency to cross fixation with the Wassermann reaction, but the latter should be made in all cases of suspected tuberculosis. In some advanced cases of pulmonary tuberculosis the reaction was negative.—P. G. H.

373. *A Comparison of Certain Antigens Used in Complement Fixation Tests in Pulmonary Tuberculosis.* H. C. YOUNG AND J. P. GIVLEN. Am. Rev. Tuberc., 1919, 3, 475-481.

Petroff's methyl alcohol soluble antigen, Corper's autolysate antigen and Wilson's bacillary antigen did not vary greatly in percentage of positive findings in known cases of pulmonary tuberculosis, 66, 63, and 57 per cent, respectively. The positive findings in the various classes by the three antigens were 11 per cent of clinically normal persons, 58 per cent of questionably tuberculous, 56 per cent of incipient, 64 per cent (66 per cent sputum positive cases) of moderately advanced, and 71 per cent of far advanced. Moribund cases gave only 44 per cent positive; 50 to 60 per cent of positive luetic serum gave cross fixation with the three tuberculous antigens.—T. G. H.

374. *Ueber den diagnostischen und therapeutischen Wert der Partial-Antigene nach Deycke-Much.* (The Diagnostic and Therapeutic Value of the Partial-Antigen of Deycke and Much.) HERMANN WALTHER. Cor.-bl. f. Schweiz. Aerzte. Basel, 1919, 49, 1577-1586.

The diagnostic value of the partial antigen of Deycke and Much was tested (254 intracutaneous injections) in 157 patients, of which 24 were clinically healthy; 28 had pulmonary tuberculosis; 54 had bone and joint tuberculosis; 43 had urogenital tuberculosis; 4 had glandular tuberculosis, and 4 tuberculous peritonitis. The therapeutic action of the preparation was noted in treatment of 34 cases.

The procedure can not be unqualifiedly recommended, either from the diagnostic assistance which is claimed for it, or from the point of view of therapy.—G. H. S.

375. *Agglutination Results with Certain Dysentery Organisms Placed against Homologous and Heterologous Sera.* A. DISTASO, E. GOODALL AND H. A. SCHOLBERG. J. Path. & Bacteriol., 1919, 22, 257.

Several strains of Shiga and Flexner organisms tested against homologous and heterologous rabbit sera showed that 4 out of 20 organisms were agglutinated by homologous sera in 1 to 2000 dilution; 5 out of 20, in 1:500; 9 out of 20 below 1:500, of which 4 agglutinated only in 1:25. In no instance was an organism agglutinated by a heterologous serum in 1:2000 dilution.

By using equal quantities of a strong suspension of an organism and a low dilution of homologous serum, it was found that the supernatant fluid after agglutination had occurred gave negative agglutination tests in 1:50, 1:100, 1:200 and 1:400 dilutions against an equal volume of the heterologous organisms. One 1:50 dilution of "Shiga 2," however, gave a slight deposit. On reversal of the conditions of this test, i.e., by using serum of high titer with the heterologous organism, it was found that the supernatant fluid gave no result with the homologous organism. This indicates that homologous and heterologous organisms produce the same agglutinin.—W. C. M.

376. *Spontaneous Agglutination of Anaerobes.* A. ZIRONI AND G. CAFONE. Sperimentale, 1919, 73, 42-56.

Spontaneous agglutination in fluid media is chiefly due to the action of salts on the bacilli. It can be avoided by dilution of the broth with 1 to 2 volumes of distilled water. (Chem. Abstr.)—G. H. S.

377. *Sur l'apparition précoce de sensibilisatrice spécifique dans l'intestin grêle des cholériques.* (The Early Appearance of Specific Antibody in the Small Intestine of Animals Injected with Cholera Vibrios.) J. CANTACUZÈNE AND A. MARIE. Compt. rend. Soc. de biol., Par., 1919, 82, 981.

Extracts of the small intestine or cecum were prepared from guinea pigs which had received injections of *Vibrio cholerae*. These extracts were employed in complement fixation tests. Fixation occurred within a few hours after the animals had been inoculated, at a time when the blood failed to show any reaction.—G. H. S.

378. *Les précipitines et les substances déviantes.* (Precipitins and Deviating Substances.) R. BRUYNOGHE. Compt. rend. Soc. de biol., Par., 1919, 82, 951.

The question of the identity of precipitins and complement deviating substances was examined. The results appear to favor the duality of the two substances.—G. H. S.

379. *Anticorps normaux et expérimentaux chez quelques invertébrés marins.* (Normal and Experimentally Produced Antibodies in Some Marine Invertebrates.) J. CANTACUZÈNE. Compt. rend. Soc. de biol., Par., 1919, 82, 1087.

Agglutinins and precipitins are normally present in the blood of some of the crustacea and tunicates. These antibodies are directed against the cells and serum of mammals, and

may be increased in titer by injection with the corresponding antigens. Other antibodies, normally not present in these animals, may be produced. With *Eupagurus bernardus* a hemolysin for rabbit, sheep or horse cells can be elaborated, which in its titer corresponds with the hemolysin normally found in *Eupagurus prideauxii*. With *Maia squinado* the immunization increases the normally present agglutinins and precipitins but no hemolysin is produced.—G. H. S.

380. *A propos de l'action spécifique de l'euglobuline du sérum vaccinal.* (The Specific Action of the Euglobulin of Vaccinal Serum.) M. HENSEVAL. Compt. rend. Soc. de biol., Par., 1919, 82, 1071.

The euglobulin of vaccinal serum is able to neutralize the effect of vaccine virus. This action can be demonstrated for the dried euglobulin as well.—G. H. S.

381. *A propos du mode d'action de l'euglobuline vaccinale sur le vaccin.* L'adsorption du virus par l'euglobuline normale. (The Mode of Action of Vaccinal Euglobulin on Vaccine. The Adsorption of Virus by Normal Euglobulin.) M. HANSEVAL. Compt. rend. Soc. de biol., Par., 1919, 82, 1074.

The euglobulins of normal sera will adsorb vaccine virus strongly, as will kaolin also. It is pointed out that adsorption and destruction are not necessarily synonymous.—G. H. S.

382. *Action du sérum des animaux infectés par le bacille pyocyaneux sur la protéase de cette bactérie.* (The Effect of the Serum from Animals Infected with *B. pyocyaneus* on Pyocyanase.) L. LAUNOY AND M. LÉVY-BRUHL. Compt. rend. Soc. de biol., Par., 1919, 82, 1274.

The antitryptic action of the serum of an infected rabbit is not altered; that of an infected guinea pig is slightly increased. No specific antiprotease is demonstrable, even though these sera agglutinate the organisms in dilutions as high as 1:1000.—G. H. S.

383. *Action des extraits de sang hémolysé et de sang autolysé.* (Action of Extracts of Hemolyzed and of Autolyzed Blood.) H. ROGER. Arch. de méd. expér. et d'anat. path., Par., 1918, 28, 325-340.

The author has performed comparative experiments in the injection of extracts of hemolyzed and of autolyzed blood.

The hemolyzed extracts were obtained by rapidly freezing and thawing defibrinated rabbit's blood several times, adding it to twice its volume of distilled water to complete hemolysis, rendering it isotonic by the addition of 0.8 per cent NaCl and filtering through paper. The resulting extract is toxic, a quantity equivalent to 9 to 17 cc. of blood killing rabbits of 2200 to 2500 grams when injected intravenously in small quantities over a period of 15 minutes, with hypotension and consequent fall in blood pressure.

The autolyzed extracts were attained by incubating sterile defibrinated rabbit blood in a sealed flask for 10 days, decanting the fluid portion and adding 2 volumes of water, after which the mixture is rendered isotonic with NaCl and filtered through paper. Such extracts are only mildly toxic, killing rabbits after the injection of large quantities, as much as 204 cc., over a period of an hour and 20 minutes. No ill effects were observed until 108 cc. had been injected, a progressive increase in blood pressure, with resulting hypertension, being observed up to this point, after which the pressure continually fluctuated, becoming subnormal soon after the last injection. It was noted that liquids artificially rendered isoviscous by the addition of a substance like gelatin produced no results comparable to those of the extracts of autolyzed blood. At autopsy, rabbits that had received the extracts of autolyzed blood showed marked dilation of the heart, engorgement of the spleen and kidneys and scanty, hemoglobin-tinged urine. The coagulation time of the heart blood was prolonged to about 1 hour. It is pointed out that toxicity decreases as autolysis progresses; with autolyzed extracts of liver or lung the increase in blood pressure is more pronounced but also more fleeting than that produced by blood autolysate. The author believes that the vascular overcharge resulting from the injection of such a large quantity of fluid does not explain all the ill effects observed and is not the principal cause of death. The autopsy findings following such injections point to a specific toxic action of the injected substance.—C. G. B.

384. *The Effect of Feeding Yeast on Antibody Production.* ELIZABETH PAULINE WOLF AND JULIAN HERMAN LEWIS. J. Infect. Dis., Chicago, 1919, 25, 311-314.

Since the diseases for which yeast has long been said to be a specific are due largely to pyogenic organisms, and since recovery from these infections is due to increased antibody production in the infected host, it seemed logical to conclude that the beneficial effects of yeast, if any exist, are due to its stimulation of antibody production.

Accordingly rabbits were fed yeast during immunization with sheep red cells. Controls were run whose diet was exactly the same except for the absence of yeast. It was found that yeast did not stimulate antibody production in the rabbit, controls often showing even better antibody production than the yeast-fed animals. The laxative value of yeast was also found to be lacking, no evidence being obtained of any effect on the gastro-intestinal tract of rabbits.—I. W. P.

**385. *Experimental Purpura.* MARK J. GOTTLIEB. J. Immunol., Balt., 1919, 4, 309-316.**

An antiplatelet serum was produced by injecting rabbits with the blood platelets of guinea pigs. The serum was toxic for normal guinea pigs, causing a reduction in number of blood platelets and giving rise to hemorrhages in various tissues and organs. The bleeding time was prolonged while the coagulation time was not affected. The serum was lytic for platelets *in vitro*. It was also hemolytic for guinea pig red cells. The serum of rabbits which had been given antiplatelet serum did not protect other guinea pigs against the effects of the antiplatelet serum; normal rabbit serum giving more protection than that of the treated rabbit.—C. G. B.

**386. *Ueber die hämolytische Wirkung der Kohlensäure und ihre Salze auf Blutkörperchen, die mit Seife und gallensauren Salzen präpariert sind.* (The Hemolytic Action of Carbonic Acid and Its Salts Upon Blood Corpuscles Treated with Soap and Salts of Bile Acids.) W. PRATZSCHKE AND K. JAUDAS. Ztschr. f. Immunitätsforsch. u. exper. Therap., Jena, 1919, 28, 368-376.**

It has been shown by Sachs and others that blood corpuscles which have been "sensitized" with soap are hemolyzed by dilute sodium hydroxide, sodium carbonate, and in general by OH-ions.

This paper reports studies on the hemolytic action of carbonic acid and sodium glycocholate on red blood corpuscles previously treated with soap. A 5 per cent suspension of washed fresh human corpuscles is treated with varying quantities of a soap solution (Sapo medic.) to determine the dosage of soap which does not hemolyze 0.5 cc. of the cells in 24 hours at room temperature. This dose is generally 0.2 cc. of a 0.4 per cent soap solution. When CO<sub>2</sub> is added to 0.5 cc. of 5 per cent suspension of red corpuscles hemolysis occurs at once. Similar results are obtained by adding 1 cc. of a 1 per cent solution of sodium glycocholate to red cells previously treated with soap.

The reverse process also occurs, in that red corpuscles treated with CO<sub>2</sub>, bile acids and bile salts, are hemolyzed when 0.2 cc. of a 0.4 per cent soap solution is added. The carbon-dioxide containing red cells of the venous blood are readily hemolyzed by soap and solutions of bile acids and bile salts.

The authors do not present an explanation of this phenomenon. They do not attribute the hemolysis to a change in the hydrogen-ion concentration of the mixtures, but suppose that the reagents used alter the permeability of the membranes of the corpuscles to anions.

The physiological significance of this type of hemolysis is pointed out. Possibly the hemolysis which bile acids and salts produce in the liver is facilitated by the previous action of CO<sub>2</sub> upon the corpuscles in the venous blood.—S. B-J.

**387. *The Mechanism of Boric Acid Hemolysis.* M. KOSAKAI. Proc. Soc. Exper. Biol. & Med., N. Y., 1919, 16, 103.**

Kosakai found that a medium containing 1 per cent boric acid did not directly injure red blood corpuscles in suspension, but the corpuscles so treated were completely hemolyzed when suddenly immersed in a suitable volume of isotonic saline or sugar solution, or in serum. No hemolysis of the treated corpuscles occurs after sudden immersion in any volume of concentrated saline or sugar solution, and after this procedure the corpuscles have also lost their sensitiveness to immersion in isotonic saline solutions. The hemolytic volume of isotonic saline solution when gradually added to the treated blood corpuscles causes no hemolysis. Further it was found that this treatment caused the corpuscles to lose their sensitiveness to sudden immersion in isotonic saline solutions. Osmotic pressure is considered to be the force operative in the "boric acid hemolysis." A diffusion of the reagent into the corpuscles has been demonstrated. For corpuscles which have been treated with a certain concentration of the boric acid, the minimal non-hemolytic concentrations of various substances are of identical "osmotic concentration."—L. W. F.

**388. *Experiments on the Removal of Hemagglutinin from Rabbit Anti-human Serum.* JOSEPH E. SANDS AND LYLE B. WEST. J. Immunol., Balt., 1919, 4, 275-284.**

Hemagglutinin delays the hemolytic action of rabbits anti-human serum on human red cells. Distinct destruction of the hemagglutinin with little or no loss of the specific hemolysin results from drying the serum in evaporating dishes or on filter paper after Noguchi's method. The use of paper amboceptor is advisable since by removal of the inhibiting hemagglutinins, hemolysis is increased. Filtration of the serum in dilutions of 1-10 through Kitasato and Chamberland filters has practically the same effect due presumably to the removal of the hemagglutinin. Similar results, though not so marked, were obtained by adsorption with barium sulphate and washed human cells. Hypertonic solutions of sodium chlorid are of no practical value in preventing hemagglutination in complement fixation tests in which an anti-human hemolytic system is employed.—R. R. H.

**389. *The Influence of the Thyroid Gland on the Formation of Antibodies.* J. KOOPMAN. Endocrinology, 1919, 3, 318-320.**

Sera of titres 1:100 or 1:150 could be raised to test 1:1200 or 1:2000 by the injection of thyroid extract followed by oral administration of desiccated thyroid. It is suggested that thyroid insufficiency may explain low amboceptor titre. (Chem. Abstr.)—G. H. S.

390. *Untersuchungen über die veränderte Agglutininbildung mit Ruhrbacillen vorbehandelter Kaninchen.* (Investigation of the Formation of Heterologous Agglutinins in Rabbits Previously Immunized with Dysentery Bacilli.) R. BIELING, *Ztschr. f. Immunitätsforsch. u. exper. Therap.*, Jena, 1919, **23**, 246-279.

Rabbits were immunized with dysentery bacilli and after a period during which the agglutinins produced in response to the first immunization had fallen to a low titer, the animals were reinoculated with other types of bacteria than the ones used in the first or "anamnesic" reaction. This second inoculation caused first a negative phase in the animals, in which the primary agglutinins still farther decreased. The negative phase was followed in 2 to 3 days by the appearance of agglutinins to the second antigen. After the fourth day, the titer of agglutinins to both antigens rose to a high value.

For example, a rabbit immunized to *B. dysenteriae* (Shiga), with an agglutinin titer of 1-400 for the Shiga bacillus, was reinoculated with a suspension of *B. typhosus*. On the third day after this inoculation, the antishiga titer was 1-200, with no agglutinin for *B. typhosus*. On the seventh day, the animal's serum showed agglutinins for both organisms, with a titer of 1:1200.

The bacterial emulsion used in the agglutinin tests was freshly prepared for each experiment and standardized by an estimation of its opacity in a test tube. No constant standard was used. The results of many experiments, however, were in general uniform.

It has been noted that smallpox vaccination and various infections in men inoculated with typhoid vaccine cause a rise in the agglutinin for *B. typhosus*. Animals immunized with one bacillary antigen are also hypersensitive to another bacterial antigen. Bieling finds that Ehrlich's side-chain theory is inadequate as an explanation of this condition of nonspecific sensitization associated with heterologous agglutinins.—S. B-J.

391. *The Loss of Complementing Power in Guinea Pig Serum at Various Temperatures.* JOSEPH W. BIGGER. *J. Path. & Bacteriol.*, 1919, **22**, 323-344.

The complementing power of guinea pig serum is destroyed in accordance with a definite law as is shown by the fact that the relationship between the strength of the complement remaining ( $x$ ) at a given time ( $t$ ) from the beginning of the experiment are expressed by the equation

$$\frac{dx}{dt} \frac{1}{xn + 1} = K.$$

In this differential equation  $t$  represents the time,  $x$  the amount of complement;  $n$  and  $k$  are constants. The values hold good for temperature of from 9°C. to 50°C.—R. R. H.

392. *Complement. I. Inactivation of Complement in Distilled Water.* R. BRUYNOGHE. *Bull. Acad. roy. de méd. de Belg., Brux.*, 1919, **29**, 209-221.

This phenomenon appears due to the alteration or destruction of a third constituent, hitherto unknown, which is distributed among both fractions in the usual separation into globulins and albumins. While heating serum to 54° for  $\frac{1}{2}$  hour destroys the mid-piece and end-piece, such serum restores much of the activity to diluted serum, showing that the third constituent is not destroyed by the heating. Similar results were obtained with serum inactivated by shaking in air (a process in which oxidation plays no part) or by centrifugation; similarly also in the case of the enzymic alteration of complement by means of cobra venom. It is thus seen that complement is of a complex nature. (Chem. Abstr.)—G. H. S.

393. *Complement. II. Substitution of the Third Constituents.* R. BRUYNOGHE. *Bull. Acad. roy. de méd. de Belg., Brux.*, 1919, **29**, 222-230.

Complement altered by dilution with distilled water may be reactivated by previously heated (53-60°) human, swine, or guinea pig sera, while those of the dog, rabbit and lamb do not have this action. With complement inactivated by shaking similar results were obtained, except that dog serum also caused partial reactivation. (Chem. Abstr.)—G. H. S.

394. *Complement. III. Constitution of Complement.* R. BRUYNOGHE. *Bull. Acad. roy. de méd. de Belg., Brux.*, 1919, **29**, 231-238.

The portions of complement rendered inactive by shaking or dilution with water and remaining unchanged by heating to 54° are not fixed by sensitized or persensitized cells, nor are they fixed by the mid-piece. Only the mid-piece is concerned in the complement deviation reaction. The portion inactivated by dilution with water is found free in positive Wassermann tests and in a similar test with hog cholera antigen. It would appear that the different components of complement have no affinity for each other and that complement consists of a whole series of distinct, free, indispensable components, just as ions may be said to exist free in solutions. (Chem. Abstr.)—G. H. S.

395. *Immunization croisée. Action réciproque du sérum d'Anguille ou du sérum de Murène sur des animaux immunisés contre l'une ou l'autre de ces ichthyotoxines.* (Cross Immunization. Reciprocal Action of Serum of the Eel and of Serum of *Muraena helena* on Animals Immunized against either of these Ichthyotoxins.) L. CAMUS AND E. GLEY. *Compt. rend. Soc. de biol., Par.*, 1919, **82**, 1240.

Cross immunization is reported.—G. H. S.

396. *Le rôle des plaquettes sanguines dans l'immunité naturelle.* (*The Role of the Blood Platelets in Natural Immunity.*) PAUL GOVAERTS. *Compt. rend. Soc. de biol., Par.*, 1919, 82, 927.

The rôle of the platelets approaches that of the phagocytes. Their action is more rapid, acting in the circulating blood. Thus, they form a first line of defense against infecting organisms.—G. H. S.

397. *Présence de substances spécifiques dans les leucocytes des animaux immunisés.* (*Specific Substances in the Leucocytes of Immunized Animals.*) ALOIS BACHMANN. *Compt. rend. Soc. de biol., Par.*, 1919, 82, 1031.

A substance can be extracted from the leucocytes of immunized animals which exerts a protective influence when injected into a normal animal along with culture.—G. H. S.

398. *Serological Detecting of Carcinoma.* MAX DE CRINIS AND ALFONS MAHNERT. *Fermentforsch., Leipz.*, 1918, 2, 103-119.

With the refractometric method protective enzymes were invariably found in the serum of carcinoma patients which digested carcinoma tissue. The enzymes were never present in healthy individuals. Tests with serum from pregnant and luetic persons were negative with carcinoma protein. There was a specificity between carcinoma and sarcoma sera and substrates. (Chem. Abstr.)—G. H. S.

399. *Zur Agglutinabilität des Weil-Felix'schen Bazillus.* (*Agglutinability of the Weil-Felix Bacillus.*) F. SCHIFF. *München. med. Wehnschr.*, 1919, No. 6; *Schweiz. med. Wehnschr.*, 1920, 1, 18.

Experiments upon changes in the agglutinability of the bacillus are reported. Washed bacilli from sugar-free agar are not agglutinated and as the sugar content of the agar is increased the degree of agglutinability is also increased. With a high sugar content a spontaneous agglutination occurs. Suspensions of the bacilli which have lost their ability to agglutinate by heating to 56°C. regain it if they are washed in saline. Cultures heated for 2 minutes at 100° are usually readily agglutinated. The effect of the sugar content of the media upon heated cultures is the same as upon the living organisms. Washed cultures, from a sugar-free medium, which are inagglutinable become agglutinable after heating. Inagglutinable cultures grown on Drigalski or Endo agar do not become agglutinable either by heating or by transfer to neutral sugar-containing agar.—G. H. S.

400. *Sulla presenza e sulla importanza delle coagglutinine negli immunseiri.* (*The Presence and Importance of Coagglutinins in Immune Sera.*) C. SARTI. *Ann. d'ig., Roma*, 1919, 29, 349.

1. Normal dog serum does not contain agglutinins for *B. typhosus*, *B. paratyphosus* A and B, *B. coli*, *B. dysenteriae* Shiga, Flexner or Hiss Y.

2. In the course of immunisation with typhoid and paratyphoid A and B, with the production of agglutinins for the specific germs, the serum acquires the power to agglutinate bacteria of a different species than those which served as antigens.

3. The appearance of coagglutinins is in direct proportion to the titer of the specific agglutinins in the serum.

4. The intensity of secondary agglutinins is not in direct proportion to the principal ones.

5. The appearance and intensity of secondary agglutinins are not identical for the various antigens injected, but vary according to the latter.

6. In the dog the principal agglutinins and the secondary agglutinins are attached, although not exclusively, to the globulin fraction of the serum and precisely to the pseudoglobulin.—P. M.

401. *Fragen der Paragglutination.* (*Problems in Paragglutination.*) PHILALETHES KUHN. *Centralbl. f. Bakteriöl. (etc.)*, Jena. I. Abt. Orig., 1917, 80, 107-117.

The phenomenon of paragglutination in an organism may be long continued, sometimes lasting months and even years. It is contended that the Weil-Felix reaction has not been proved to be the result of a mixed infection with typhus patients with proteus. Apparently the reaction conforms in all respects to a paragglutination. It is possible that in other diseases with unknown causal organisms the reaction of paragglutinable accompanying organisms may be used as an aid in the diagnosis.—R. E. B.

402. *Ueber Dysagglutination und ihre Bedeutung.* (*Dysagglutination and Its Significance.*) STEFAN STERLING-OKUNIEWSKI. *Centralbl. f. Bakteriöl. (etc.)*, Jena. I. Abt. Orig., 1919, 82, 475-477.

Dysagglutination is the phenomenon of the reduction in agglutinability resulting from constant contact with potent specific serum. Finally, as in typhoid, the strain becomes inagglutinable. The phenomenon has been termed serum fastness by Müller. Parallel changes in morphology and acid production have also been observed.—R. E. B.

403. *Ueber die von v. Liebermann und Acél angegebene Vereinfachung der Widal'schen Reaktion.* (On the Simplification of Widal Reaction Suggested by Von Liebermann and Acél.) KUNIGUNDE WEBER. *Centralbl. f. Bakteriologie* (etc.), Jena. I. Abt. Orig., 1917, 80, 117-119.

The protocols indicate that the simplified Widal of Von Liebermann and Acél constitutes a real simplification, especially in those cases in which a centrifuge is not at hand for use. It is also usable with killed cultures of bacteria.—R. E. B.

404. *A Biologic Classification of Hemolytic Streptococci.* LEON H. HAVENS. *J. Infect. Dis.*, Chicago, 1919, 25, 315-330.

In this report are included 292 strains of hemolytic streptococci obtained from widely different human sources, pathological and otherwise. Careful rabbit immunization experiments showed that 93 per cent of these strains fell into three fairly clearcut groups which could be differentiated serologically and by protection experiments in mice. Cross-agglutination between the groups occurred rarely except in low dilutions, and each immune serum afforded protection only against its homologous group. Group I was the largest, comprising 47 per cent, Group II the smallest with 19 per cent and Group III 27 per cent. The remaining 7 per cent seemed to form a heterogeneous group.

Necropsy strains fell largely into Group I indicating that this is the most virulent group, though no group predominated in the causation of empyema. Group III was found most frequently in cases of tonsillitis, though the importance of this observation is somewhat qualified by the fact that all these cases occurred in one ward and may have had a common source.

About 10 per cent of the strains showed some relation to other groups than their own, exhibiting some cross-agglutination and being somewhat sensitive to the heterologous sera. This seems to indicate that the hemolytic streptococci can not be as clearly differentiated into groups as the pneumococci, but that the groups tend to overlap.—I. W. P.

405. *Observations on Streptolysin.* Y. MAKAYAMA. *J. Infect. Dis.*, Chicago, 1919, 25, 509-518.

One strain of hemolytic streptococcus was studied to investigate the relation of lysin production to virulence and to determine other properties of the lysin. The production of lysin by this streptococcus, when grown in serum broth cultures at 37°C., was scanty during the first 5 hours, but rapidly increased after 10 hours, and decreased after 48 hours. The lysin production began and ended earlier than the production of acid.

On passage of this streptococcus through animals, the production of lysin became more intense coincidently with an increase of the virulence of the organisms. The lysin also became more specifically active for the corpuscles of the animal through which the streptococcus was being passed. This simultaneous increase of virulence and hemolytic power did not occur in cultures of the organism. The streptococcus lost its virulence after a short period of cultivation on blood agar, but retained its hemolytic power in cultures during a period of 42 days.

Filtrates of broth cultures, through Maassen filters, were found to be hemolytic, although less active than the broth before filtration. Suspensions of washed streptococci, after centrifugation, were not hemolytic.

The clear filtrates of broth cultures were tested for the toxicity of the streptolysin. Large doses, 3 to 5 cc. were found to cause diarrhea and emaciation in rabbits; small quantities were without effect. The lysins were absorbed from the filtrates by allowing them to unite with corpuscles at low temperature and removing them with the sediment of corpuscles thrown down in the centrifuge. Filtrates, from which the specific lysin for mouse red corpuscles had been thus removed, remained as toxic for mice as the original broth culture filtrate, showing that the lysin was not the only toxic principle in the filtrate.—S. B-J.

406. *Observations on the Production of an Antihemotoxin for the Hemotoxin of Bacterium welchii (Bacillus aerogenes capsulatus).* WILLIAM W. FORD AND GEORGE HUNTINGTON WILLIAMS. *J. Immunol.*, Balt., 1919, 4, 385-392.

Hemotoxin from strains of *B. welchii* from Baltimore milk was obtained by inoculating large flasks of sterile milk (800 to 1000 cc.) with 24 to 48 hour milk culture (10 to 12 cc.). The flasks are incubated at 37°C. for 24 to 48 hours; the contents are then filtered through coarse filter paper and the filtrate immediately neutralized by caustic soda or caustic potash. The product is refiltered or passed through a Berkefeld candle until clear. These hemolytic solutions have varying titers of from 1-20 to 1-100 for 5 per cent suspension for rabbit cells. An antihemotoxin of titer of 1-1000 was produced by treating rabbits with increasing doses of hemotoxin subcutaneously, demonstrating that this substance can act as an antigen, proving that it is a true hemotoxin.—R. R. H.

407. *Pfeiffer's Bacillus and Influenza. A Serological Study.* M. WOLLSTEIN. *J. Exper. M.*, Balt., 1919, 30, 555-568.

The author presents the results of serological studies started during the recent epidemic. For serological work she found the most suitable medium for the growth of Pfeiffer bacillus to be made by adding 2 or 3 drops of the supernatant fluid from centrifuged fresh rabbit's blood which has been boiled 2 minutes, to 5 cc. of melted agar (pH 7.5) and then



slanting, or by adding 0.5 cc. of this same fluid to 20 cc. broth (pH 7.8) for a fluid medium. For primary isolation of the organisms, however, Avery's oleate agar was recommended, and for keeping stock cultures viable 6 weeks or more blood broth was preferred. The sera used were either from convalescent patients, or monovalent immune rabbit sera, immunized with repeated injections of living organisms intravenously.

Agglutination reactions were found to be unsatisfactory, for many strains clumped spontaneously whereas others were inagglutinable in all sera tested. Again it was found that certain sera had a higher agglutinin content for heterologous than for homologous strains. None of the sera from convalescent influenza patients contained agglutinins in dilutions above 1:40, except 2 cases complicated by bronchopneumonia (1:100); while other persons who had been vaccinated with polyvalent Pfeiffer bacillus vaccine seldom showed agglutinins above 1:100.

Complement-fixing antibodies were demonstrated in a number of influenza patients in dilutions of 1:5 to 1:20 appearing as early as one week after onset but not demonstrable after the third month. No complement-binding antibodies were found in normal individuals or those suffering with other respiratory diseases. A complicating pneumonia increased the complement-binding power of the sera. Monovalent immune rabbit sera (10 strains) all bound complement in the presence of both heterologous and homologous antigens; normal rabbit sera were all negative.

Precipitins were demonstrated in all convalescent patients' sera tested, as well as in rabbit immune sera; absent in normal controls. Homologous antigens were no stronger than heterologous.

A poisonous filtrate of varying toxicity was obtained from all of 25 strains studied, causing extensive punctate hemorrhages and edema in the tissues and early death. The author was unable to produce an antiserum in rabbits with these filtrates that would protect against more than one lethal dose, so that doubt as to its being a true toxin was indicated. Attempts to protect mice by means of rabbit sera made with poisonous filtrates proved unsatisfactory, as did human convalescent sera.

The author states that the strains of Pfeiffer's bacillus isolated during the epidemic were morphologically and biologically similar to the strains isolated from influenzal cases in other years, and antigenically they differed from them only quantitatively. She concludes that the serological reactions are not sufficiently clean cut and stable to signify that the Pfeiffer bacillus is the specific inciting agent of epidemic influenza, but does indicate the parasitic nature of the organism, its very common occurrence as a secondary invader and its influence on the course of the pathological process.—W. P. B.

408. *On the Existence of a Multiplicity of Races of B. influenzae as Determined by Agglutination and Agglutinin Absorption.* EUGENIA VALENTINE AND GEORGIA M. COOPER. J. Immunol., Balt., 1919, 4, 359-379.

A large number of strains (about 150) of *B. influenzae* was tested for agglutination and agglutinin absorption with immune sera prepared by immunizing rabbits (intravenous inoculations) with about 25 strains respectively. One strain isolated in 1914 was included in the study. Many of the strains come from closely associated groups of cases,—six from a single family.

A very small number of cross-agglutinations was encountered and still fewer instances of cross-absorption occurred.

It is concluded that the term *B. influenzae* represents an immunologically heterogeneous group of organisms and that it is very improbable that *B. influenzae* is the primary etiologic agent in epidemic influenza.—C. G. B.

409. *A Study by the Single Cell Method of the Influence of Hemologous Antipneumococcic Serum on the Growth Rate of Pneumococcus.* M. A. BARBER. J. Exper. M., Balt., 1919, 30, 569-587.

In many series of hanging drop preparations each containing a single pair of pneumococci in varying dilutions of homologous, heterologous and normal horse serum, incubated 170 minutes, fixed, stained and the actual number of organisms counted the author found no evidence of a measurable inhibition of growth in the homologous sera. There was a striking tendency toward thick capsule formation and clustering in zooglea-like masses. Similarly tubes of broth with varying dilutions of homologous, heterologous and normal serum were seeded with a single pair of organisms and observed for longer periods of time, but although clumps formed at the bottom in the homologous sera there was no evidence of any diminution in the rate of growth. Likewise the addition of complement did not affect the growth. In view of the possibility that the homologous serum acquired some growth-inhibiting substance through contact with animal tissues *in vivo*, similar experiments were made, using the blood of a rabbit that had received 5 cc. of Type I immune horse serum intravenously one hour previous, plus broth into which a single Type I pneumococcus was inoculated. Controls were made with normal blood and with immune serum plus normal blood. The rate of growth in the blood from the animal that had received immune serum was practically the same as that in the blood from the normal animal. Again the tendency to capsule formation appeared in the hanging drops containing the homologous immune serum and in those containing the blood of the rabbit which had received immune serum, but not in the normal blood controls. The same results were obtained using either the serum or plasma of passively immunized rabbits as with the whole blood.

The action of homologous serum *in vivo* was further studied by passively immunising mice with homologous serum, then inoculating intraperitoneally and examining the exudate at intervals in hanging drops, stained films and plate cultures. In the immunised mice many phagocytes were found an hour after injection, containing numerous intracellular pneumococci and very few extracellular organisms, although these latter organisms were viable, and when isolated continued to grow at the normal rate. No evidence of bacteriolysis ascribable to the homologous serum could be found. In the controls although leucocytes and cocci were numerous, there was very little if any phagocytosis.

Apparently the growth of extracellular pneumococci in the peritoneal cavity of the immunised mouse continued until overtaken by phagocytosis. Capsule formation in these cases was marked, but in Type I infection this seemed to interfere little with phagocytosis, and there was no proof that capsules were of importance in the protection of the bacteria.

Antipneumococcal serum caused marked agglutination of homologous organisms and had the power of changing them so that they underwent phagocytosis, but according to the author its immunizing and protective power probably depends on properties which are not at present known.—W. P. B.

**410. Antiblastic Phenomena in Active Acquired Immunity and in Natural Immunity to Pneumococcus.** M. A. BARBER. J. Exper. M., Balt., 1919, 30, 589.

This paper gives the results of a series of experiments to determine whether antiblastic or bactericidal phenomena play any part in immunity to pneumococcus. The author utilizes his technic for the isolation of single bacteria and their growth in hanging drops, just as in his preceding paper. He found that there was as much inhibition of growth of a virulent strain of pneumococcus Type II in whole fresh blood, coagulated plasma, or serum from a normal horse as from one highly immunised against this same organism. On the other hand, the whole blood (citrate and non-citrate) of a pigeon, which is a naturally immune species, failed to inhibit the growth of virulent pneumococci, Type I and II any more than did rabbit controls. Thus, with the technic employed the author was unable to demonstrate that antiblastic phenomena played any part either in active acquired immunity in horses or in natural immunity in pigeons.—W. P. B.

**411. Detection of Protective Enzymes in Very Small Quantities of Serum-Micro-Abderhalden Reaction.** FRITZ PREGL AND MAX DE CRINIS. Fermentforsch., Leipz., 1917, 2, 58-73.

Protective enzymes are detected by changes in the refractive index of the serum, measured by the Pulfrich immersion refractometer. For the pregnancy test, dried placenta is weighed out, accurately to a milligram, in a small closed glass cell, covered with boiling physiological saline solution, and allowed to stand for 1 hour. The saline is then removed from the swollen substrate and a definite volume, usually 2.3 cc. of active serum is added to the cell. A control test is made with inactivated serum. The cells are closed to prevent evaporation. Incubation at room temperature follows. Bacterial growth may be kept down with thymol. The refractive indices are determined 5 minutes and 24 hours. In pregnancy a distinct increase should occur in the refractive index with the active serum. In 6 cases the increase ranged from 19 to 41 units of the fifth decimal; the change with the inactive serum amounted to 1 or 2 units of the fifth decimal. Using the same technic and a proper substratum protective enzymes attacking testicle were demonstrated in cases of dementia praecox, those attacking lung in tuberculosis, those attacking liver in cases of melancholia, and those attacking brain cortex in diseases of that organ.

A micro method of conducting the test is described. (Chem. Abstr.)—G. H. S.

**412. Further Studies on the Behavior of Different Blood Sera toward Different Organ Substrates.** EMIL ABDERHALDEN. Fermentforsch., Leipz., 1918, 2, 167-193.

The tabulated results obtained with the sera of diseased persons occupy 21 pages, those obtained in the study of deformity, 3 pages. (Chem. Abstr.)—G. H. S.

## SERUM THERAPY

(See also Numbers 170, 487)

**413. The Poisons of the Influenza Bacillus.** JULIA T. PARKER. J. Immunol., Balt., 1919, 4, 331-357.

Toxic filtrates were obtained from cultures of *B. influenzae* when grown from 5 to 24 hours in a veal infusion broth containing 2 per cent peptone and adjusted to a pH value of from 8 to 8.2. Toxic extracts, which were also filterable, were obtained from both fresh and autolyzed bacilli. About 2 cc. of the filtrates killed rabbits of medium size within a few hours when given intravenously. Subcutaneous and intraperitoneal injections were not fatal. The chief symptoms caused by the filtrates were: rapid breathing, dyspnea, rise of temperature, weakness and loss of weight. The bacillary extracts gave rise to similar symptoms but they were much less potent. The filtrates contained two poisons, one thermolabile and the other thermostable.

Sera of animals immunized with the toxic filtrates neutralized 1 or 2 lethal doses of the poison both *in vitro* and *in vivo*. More than 3 lethal doses of poison could not be neutralized by any amount of immune serum. The sera of animals treated with the bacillary extracts did not neutralize the broth poison and vice versa. The sera agglutinated the bacilli and contained very potent complement-fixing antibodies.

The poisons produced by one strain of bacilli were neutralized by a serum prepared with the filtrate of any other strain.—C. G. B.

414. *Toxins and Antitoxins of Bacillus dysenteriae Shiga*. P. K. OLITSKY AND I. J. KLIGLER. J. Exper. M., Balt., 1920, 31, 19.

From cultures of *B. dysenteriae* Shiga the authors have separated both an exotoxin and an endotoxin, which are physically and biologically distinct. The exotoxin was prepared by growth in a medium consisting of plain meat infusion broth mixed with one-third its volume of a 10 per cent solution of egg albumin, adjusting the mixture to pH 7.6 to 7.8 and distributing in wide 2 liter flasks to permit maximum aëration. The medium was inoculated with one-half of a 24-hour agar slant culture of the Shiga bacillus, incubated at 37°C. for 5 days, shaking repeatedly, and filtered through a Berkefeld N candle. This toxic filtrate when injected intravenously into rabbits regularly produced paresis or paralysis of the extremities directly in proportion to the dosage, with incontinence of urine and feces, but no mucoid or bloody diarrhea. On autopsy there was a striking absence of intestinal lesions, whereas in the cerebrospinal system, particularly in the gray matter of the medulla and cervical cord, there were discreet hemorrhages, scattered areas of necrosis, perivascular round cell infiltration and chromatolysis, degeneration and karyorrhexis of the neurons. Inasmuch as this toxin was shown to have a definite period of incubation, depending on the dosage varying from a few hours to 4 days, was precipitated with the globulin fraction, was relatively thermolabile being destroyed by heating to 75°C. for one hour, produced an antitoxin when injected intravenously into a horse in repeated increasing doses which neutralized the toxin according to the law of multiple proportions, and was not neutralized by other types of immune sera, such as antitetanic and antimeningococcal sera, it was regarded as an exotoxin and a neurotoxin. An exotoxin with these same properties was obtained from 5 different Shiga strains, and were evidently identical since all were neutralized by the antitoxic serum produced from one of these strains.

On the other hand an endotoxin of entirely different nature was obtained: (1) by growth on agar in a Blake bottle for 24 hours, washing off the growth in 15 cc. saline, incubating the saline suspension at 37°C. for 2 days and filtering through a Berkefeld N candle, and separating from the exotoxin by addition of 1 cc. of anti-exotoxic serum to 2 cc. of the filtrate, then incubating one-half hour at 37°C.; or (2) by growth in egg albumin broth for 22 days, filtering, and heating to 80°C. for one hour to destroy the exotoxin. This endotoxin consistently produced subnormal temperature, loss of weight, mucous and bloody diarrhea, in proportion to dosage but no nervous symptoms, and the autopsies revealed edema, thickening and small hemorrhages in the walls of the large intestine and occasionally of the ileum, blood tinged mucus in the lumen, hyperemia, swelling and small ulcerations in the villi, but no lesions in the cerebrospinal nervous system. The endotoxin was more resistant to heat than the exotoxin, although destroyed by heating to 85–90°C. for one hour, was not neutralized by anti-exotoxic serum, but was neutralized by an antibacterial serum prepared by actively immunising horses with Shiga bacilli. It was therefore regarded as an endotoxin and enterotoxin.

The importance of a potent antidysenteric serum containing antibodies against the exotoxin as well as the endotoxin was indicated; and the authors found that the stock polyvalent antidysenteric serum prepared at the Rockefeller Institute from horses by repeated injections with live cultures of Shiga and Flexner bacilli over a period of several years contained at least 2000 anti-exotoxic units per cubic centimeter as well as 400 anti-endotoxic units and agglutinins in high dilutions.—W. P. B.

415. *A New Method of Testing Antitoxic Dysentery Serum*. YOSHIMOTO FUKUHARA. J. Immunol., Balt., 1919, 4, 299–307.

An antidysentery serum (Shiga) was arbitrarily selected as "standard" and preserved in a dry state in vacuum tubes. The standard antitoxin unit adopted was the amount of serum that neutralized 100 lethal doses of a certain toxin. Other sera were titrated by means of a standard serum L+ dose of toxin. Rabbits were used as the test animal, the injections being made into the vein after the mixtures of toxin and antitoxin had stood at 37°C. for one hour. The results were read in terms of death or survival within from 4 to 5 days.

It is pointed out that not every strain of dysentery bacilli is suitable for toxin production, only one (strain Fujimoto) of ten strains studied yielding a potent toxin. The medium used was a mixture of peptone prepared from pigs' stomachs and meat infusion broth. The muscle sugar was removed from the meat by the acetic acid method of Hida. The reaction was that given by 5 per cent normal NaOH beyond the neutral point to phenolphthalein. From 0.01 to 0.005 cc. of the toxin killed rabbits of 1500 grams weight within from 4 to 5 days, the toxin being given intravenously.—C. G. B.

416. *A New Method for Testing Antityphoid Serum.* YOSHIMOTO FUKUHARA AND MASAOKI YOSHIOKA. J. Immunol., Balt., 1919, 4, 285-298.

The following method is proposed for the standardisation of antityphoid serum: The 24-hour lethal dose of a strain of typhoid bacilli for guinea pigs of from 250 to 300 grams weight was determined by intraperitoneal inoculations. Ten lethal doses of the bacilli were mixed with varying quantities of an antityphoid serum and the amount of serum which just sufficed to protect guinea pigs against this quantity of culture was designated as a protective unit. The serum used (standard serum) contained 4410 protective units per cubic centimeter. To standardise an unknown serum the L+ dose of the culture to be used is first determined, and the amount of the serum being tested which just permits the death of the guinea pigs within 24 hours contains one protective unit. The value of the serum is expressed by the number of such units contained in 1 cc.

It was found that a particular serum gives the same titer with any strain of typhoid bacilli, the results being independent of the virulence and source of the strain.—C. G. B.

417. *Zur Frage der Heilwirkung des Diphtherieserums.* (The Curative Action of Diphtheria Antitoxin.) W. KOLLE AND H. SCHLOSSBERGER. Med. Klin., 1919, No. 1; Schweiz. med. Wchnschr., 1920, 1, 38.

A report on the results of a large number of animal experiments involving the use of many strains of *Bact. diphtheriae*, both as regards their virulence and their ability to produce an extracellular toxin. Virulence and toxin production were unrelated. The strains showed a marked difference in virulence. From the experiments on the action of antitoxin the following conclusions are drawn:

1. The curative action of the serum parallels the antitoxin content.
  2. The serum produced with the American D-5 strain is active against heterologous toxins.
  3. The results of the serum injection correspond with the time when it is injected; early injection giving most satisfactory curative results.
  4. Normal horse serum may be of some value clinically but it fails to neutralize the toxin.
  5. The greater the time elapsed after the infection, the larger must the dose be to show therapeutic action.
  6. After the infection has progressed to a certain point serum therapy is without effect.
- G. H. S.

418. *Sur l'ultrafiltration du sérum antidiphthérique.* (Ultrafiltration of Diphtheria Antitoxin.) M. HENSEVAL. Compt. rend. Soc. de biol., Par., 1919, 82, 913.

In filtration through collodion the greater part of the antitoxin is retained in the filter, as is also the greater portion of the albumins. The small amount of antitoxin which passes through corresponds with the quantity of pseudoglobulins which occur in the filtrate.—G. H. S.

419. *Réactions sériques au cours de la sérothérapie antitétanique chez les soldats.* (Serum Reactions in Soldiers after Antitetanic Therapy.) G. DROUET. Thesis, Univ. Paris, 1919. Presse méd., Par., 1919, 27, 474.

In primary subcutaneous injections of Pasteur Institute antitetanic serum, 37 per cent gave no or negligible reactions, 31 per cent local reactions (local rash, glandular enlargement), and 31 per cent generalized reactions (rash, fever, diarrhea, etc.). In second or third injections: negligible reaction, 20 per cent; local, 60 per cent, general, 20 per cent. More marked reactions were noted when the interval between injections was short. American "carbolicized" serum seemed to induce more reactions than heated French serum. Intraspinal injections, carefully made, give no higher per cent of accidents; intravenous reactions are dangerous. The precipitin theory is sufficient explanation, without involving anaphylactic hypotheses. Indiscriminate sero-therapy should be curtailed.—L. A. K.

420. *Le typhus exanthématique. Son traitement par les injections intraveineuses de sérum de convalescents.* A propos de l'épidémie de typhus du camp de prisonniers de Wittenberg, (1914-1915). (Typhus Fever: Its Treatment by Intravenous Injections of Convalescent Serum, with Reference to the Epidemic at the Wittenberg German Prison Camp—1914-1915.) G. MONVOISIN. Thesis, Univ. Paris, 1918-19. Presse méd., Par., 1919, 27, 389.

A discussion of the etiology and clinical aspects. Intravenous injections of human convalescent serum appeared inoffensive to typhus patients. One to 2 cc. brought a marked drop in temperature and general improvement in condition. In the face of a prevailing mortality of 30 per cent, 29 cases treated at the same period of the epidemic suffered 3 deaths (10.34 per cent). The serum should be obtained from a patient on the eighth apyretic day.—L. A. K.

421. *The Action of Gas Edema Serum.* W. KOLLE, H. SACHS AND W. GEORGI. Ztschr. f. Hyg., 1919, 86, 113-153.

Agglutinins and complement-fixing substances in different amounts were found in a polyvalent serum for various organisms which may cause gas gangrene. The serum also contains antibacillary substances, antitoxin, and antiferment. Normal horse serum has a certain amount of nonspecific curative and prophylactic action. (Chem. Abstr.)—G. H. S.

422. *Toxikologische Untersuchungen des M. Ficker'schen Gasödemtoxins und Antitoxins.* (*Toxicologic Investigation of Ficker's Gaseous Edema Toxin and Antitoxin.*) W. STRAUB. München. med. Wehnschr., 1919, No. 4.

The intravenous injection of filtrates of the cultures causes a marked decrease in blood pressure and finally a complete cessation of the heart. If the injections are given rapidly, (0.03 cc. within 30 seconds) it is fatal; six times this amount can be injected, however, provided the injection is given slowly (100 minutes). Neutral mixtures of toxin and antitoxin have no effect on blood pressure. An injection of antitoxin given a few hours to several days before the toxin injection prevents the fall in blood pressure. (Cor.-bl. f. schweiz. Aertze.)—G. H. S.

423. *Complications broncho-pulmonaires graves de la grippe, traitées par injections intra-trachéales de sérum antipneumo- et antistreptococcique.* (*Severe Broncho-pulmonary Complications of Grippe, Treated by Intratracheal Injections of Antipneumococcus and Antistreptococcus Sera.*) E. A. BOSSAN. Compt. rend. Soc. de biol., Par., 1919, 82, 829.

Fifteen cases of influenza with severe broncho-pulmonary complications were treated with antipneumococcus and antistreptococcus sera by intratracheal needle injection. Usually 60 cc. of serum (antipneumococcus 40 cc. antistreptococcus, 20 cc.) were injected. Abrupt fall in temperature followed within 4 to 6 hours, and if a rise occurred later a second injection of 40 cc. was given. The results of treatment are considered as favorable. No anaphylactic manifestations were noted.—G. H. S.

## ANAPHYLAXIS

(See also Number 427)

424. *Anaphylactic Death in Asthmatics.* T. HARRIS BOUGHTON. J. Am. M. Ass., Chicago, 1919, 73, 1912.

About 4 per cent of asthmatics are sensitive to horse serum. Injection of antitoxin prepared from horse serum may produce serious symptoms or death. In a case reported by the author one minim injected into the circulation caused death. Present methods of desensitization are uncertain. A cutaneous test should be applied to asthmatics requiring antitoxin treatment. The author suggests that sera be prepared from other animals than the horse for use in asthmatic patients.—P. G. H.

425. *Maladie sérique consécutive aux injections de sérum bovin.* (*Serum Sickness Following Injections of Bovine Serum.*) ARNOLD WETTER AND MME. COSMVICI. Compt. rend. Soc. de biol., Par., 1919, 82, 1152.

The authors do not agree with Penna, Cuenca and Kraus that bovine serum does not give serum sickness.—G. H. S.

426. *A Case of Anaphylactic Shock.* *Leaves from a Medical Note Book.* (1914-1918.) VII. Guy's Hosp. Gaz., Lond., 1919, 33, 360.

The writer notes the infrequency of grave anaphylaxis following the use of antitetanic serum, even in its repeated use prophylactically in individuals during the course of the war. This probably was due to the small dosage used, and to the fact that it was not administered intravenously. However, when the dosage was raised in 1918, true anaphylactic shock probably occurred in some cases. A case is cited of a man admitted to a dressing station with a small superficial wound on the buttock received in battle. He was in a serious state of collapse, with vomiting, pallor, sweating, and imperceptible pulse. The heart sounds heard at the apex were very faint, but the beating was rapid. He was quite clear mentally. Careful examination was made to exclude the presence of an intra-abdominal lesion or deep hemorrhage. The patient had received anti-tetanic serum half an hour before at the advanced dressing station. It was found that on two or three occasions he had received anti-tetanic serum for wounds or trench feet, and felt very ill following each administration. The condition was diagnosed as anaphylactic shock. No obvious improvement followed treatment after two or three hours, but an almost universal urticarial rash developed. He was sent to the casualty clearing station, where he was received in the condition described, and by the next day he was nearly normal again.—L. W. F.

427. *Plotzlicher Tod nach Typhus-Schutzimpfung.* (*Sudden Death Following Typhoid Inoculation.*) S. OBERNDORFER. Deutsche mil.-ärztl. Ztschr., Berl., 1918, Nos. 15-16; Schweiz. med. Wehnschr., 1920, 1, 17.

The author records a case, with autopsy, of death occurring within 8 hours of the injection of 0.5 cc. of typhoid vaccine. The necropsy revealed an advanced luecic mesoarteritis, fibrous myocarditis and dilatation of the heart. It is thus concluded that such cases as are reported have been associated with some lesion of the circulatory system.—G. H. S.

428. *Anaphylaxie-immunité.* (*Anaphylaxis-Immunity.*) MAURICE ARTHUS. Compt. rend. Soc. de biol., Par., 1919, 82, 1200.

The state of anaphylaxis-immunity results from repeated injections of toxic protein substances, such as the venins. Following such injections the animals appear anaphylactic to injection of horse serum and immune to injections of venom.—G. H. S.

429. *De l'état d'anaphylaxie et l'état d'immunité.* (*The States of Anaphylaxis and of Immunity.*) MAURICE ARTHUS. *Compt. rend. Soc. de biol., Par.*, 1919, 82, 1202.  
With injections of venom the anaphylactic condition is followed by a state of immunity.—G. H. S.

430. *Immunité et anaphylaxie.* (*Immunity and Anaphylaxis.*) MAURICE ARTHUS. *Compt. rend. Soc. de biol., Par.*, 1919, 82, 1230.

The experiments of Nolf with dogs immunized and sensitized with cobra venom lead him to conclude that the anaphylactic and immune conditions are both manifestations of the same organic state. If this is true, all immune conditions should be preceded by an anaphylactic state. Furthermore since the anaphylactic condition in the rabbit is not specific, the immune reaction must not be specific. Arthus fails to agree with this conception, and since the immunity is specific, while the anaphylactic reaction is not specific, he concludes that the two phenomena are distinct and unrelated.—G. H. S.

431. *Preponderating Intervention of the Vagus in the Circulatory and Respiratory Systems of Anaphylactic Shock.* HENRI DE WAELE. *Bull. Acad. roy. de med. de Belg., Brux.*, 1919, 29, 435-486.

Both series of symptoms denote a paralysis of the vagus centre, frequently preceded by a short stimulation of the center. The phenomena of shock are also produced by various substances in sufficiently large doses to produce an energetic thromboplastic effect, such as Witte's peptone, Na nucleinate, KI, atropine sulfate, amyl nitrite, suprarenine, etc. The mechanism of these effects is discussed in detail, with protocols and tracings. (*Chem. Abstr.*)—G. H. S.

432. *Ein Fall von Salvarsanallergie.* (*A Case of Salvarsan Allergy.*) J. SAPHIER. *München. med. Wchnschr.*, 1919, No. 5; *Schweiz. med. Wchnschr.*, 1920, 1, 18.

A case of salvarsan (neosalvarsan) allergy is reported. The reactions occurred after the second and third injections.—G. H. S.

433. *Weitere Mitteilung über die Einwirkung von Anaphylatoxin auf den isolierten Darm, nebst vergleichenden Versuchen über den Schädigenden Einfluss des erhitzten artgleichen Serums auf die Bewegung des isolierten Darmes.* (*Further Study of the Effect of Anaphylatoxin on the Isolated Intestine, with Comparative Investigation of the Injurious Effect of Heated Homologous Serum on the Movement of the Isolated Intestine.*) E. FRIEDBERGER AND G. JOACHIMOGLU. *Ztschr. f. Immunitätsforsch. u. exper. Therap.*, Jena, 1919, 23, 198-216.

This paper is an answer to criticisms of the earlier work of Friedberger. Several investigators reported that the so-called anaphylatoxin in its action upon the isolated intestine of guinea pigs and mice was not different from the effect produced by active and inactivated homologous and heterologous sera.

Friedberger repeats his earlier work on the effect of anaphylatoxin produced by the action of normal rabbit serum on *B. prodigiosus*. Tracings are reproduced showing that the movements of the isolated rabbit intestine are absolutely inhibited by the addition to the solution surrounding the intestine of 30 cc. of active rabbit serum which had been incubated with a suspension of *B. prodigiosus* for 1 hour at 37°C. and 24 hours at room temperature. This is the characteristic paralyzing action of anaphylatoxin.

When inactivated heated homologous serum alone is applied to the isolated intestine under the conditions used in studying anaphylatoxin, peristaltic movements are impeded and there is a persistent contraction of the intestine. The action of inactive serum, however, has no regularity.

It was found that this toxic effect of inactivated serum was due in part to the increased alkalinity of the serum consequent upon the loss of CO<sub>2</sub> during the heating of the serum. When CO<sub>2</sub> is retained in the serum or added to the broth surrounding the intestine, the injurious effect of inactivated serum is largely removed.—S. B-J.

434. *La suppression du choc "anaphylatoxique."* (*The Suppression of Anaphylatoxic Shock.*) W. KOPACZEWSKI. *Compt. rend. Soc. de biol., Par.*, 1919, 82, 836.

Protocols of experiments are given which show that toxicity of the toxin produced by mixing serum and bacteria or colloidal gels can be markedly decreased by adding glycerin to the serum before the contact is made. The change is due to an increase in the viscosity. If the surface tension of the serum is diminished by the addition of soap or saponin anaphylatoxic shock is completely prevented.—G. H. S.

435. *De l'anaphylaxie passive du lapin.* (*Passive Anaphylaxis in the Rabbit.*) M. ARTHUS. *Arch. internat. de physiol., Liège & Par.*, 1919, 15, 164-178.

A state of passive anaphylaxis can be developed in a rabbit by the introduction, intraperitoneal or intravenous, of serum or defibrinated blood derived from a rabbit actively sensitized. Such a transmission is not always secured; the most successful results are obtained when the blood is derived from an animal which has been subjected to a long series of subcutaneous injections of the antigen (horse serum). Passive anaphylaxis can similarly be secured with cobra venom. Such anaphylactic reactions are usually weak, and lack specificity. (*Physiol. Abstr.*)—G. H. S.

436. *On the Relation Between Degree and Duration of Protein Sensitization in Guinea Pigs and Dogs.* J. AUER. J. Pharm. Exp. Ther. Proc., 1919, 13, 511.

Guinea pigs were sensitized to horse serum and the degree of sensitization determined at periods up to 3 years. Sixteen days after sensitization 0.6 cc. of serum usually kills in a few minutes; on or before 68 days, and up to 225 days, the fatal dose is 0.05 cc.; after 1121 days, the degree of sensitization sinks to a low level and 0.5 cc. causes only slight respiratory symptoms. In the case of dogs, a powerful anaphylactic fall of blood pressure may be obtained 1 year after sensitization, but not after 3 years. Anaphylactic incoagulability of the blood may be lost within 1 year in an animal which responds typically as far as blood pressure is concerned. (Physiol. Abstr.)—G. H. S.

437. *Traitement de l'intolérance du nourisson pour le lait par l'injection sous-cutanée de lait.* (The Treatment of Milk-Intolerance in Infants by Injection of Milk.) E. WEILL. Presse méd., Par., 1919, 27, 601.

Digestive disturbance not attributable to a gastro-intestinal lesion, an infection, or intoxication from altered food may be considered of anaphylactic origin. Subcutaneous injections of 5 to 10 cc. of the sterilized human or cow's milk (depending on the feeding) gives relief from crying, insomnia, vomiting, etc., which appears to be permanent after 1 or 2 doses. The longest period of observation was 6 months.—L. A. K.

438. *Phénomènes de type anaphylactique dans la pathogénie de certaines crises comitiales.* (Phenomena of an Anaphylactic Type as Factors in the Pathogenesis of Certain Epileptic Crises.) PH. PAGNIEZ AND P. LIEUTARD. Presse méd., Par., 1919, 27, 693.

Ingestion of chocolate with a meal was found to induce a sharp leucopenia and onset of symptoms in an epileptic;  $\frac{1}{15}$  the offensive dose ingested 45 minutes before the full amount was followed by normal digestive leucocytosis and no epileptic symptoms. Normal subjects did not react to the test dose. An anaphylactic-antianaphylactic phenomenon is suggested.—L. A. K.

439. *Anaphylaxie et Gestation.* (Anaphylaxis and Gestation.) F. DURANI REINALS. Compt. rend. Soc. de biol., Par., 1919, 82, 830.

Three guinea pigs were sensitized with horse serum during gestation. The injections were given at such a time that at least 15 days elapsed between the injections and the termination of pregnancy. An intravenous injection of 1 cc. of horse serum in the young resulted in anaphylaxis. The mothers were but slightly anaphylactic.—G. H. S.

## VACCINE THERAPY

(See also Numbers 180, 181, 296)

440. *Immunity Results from Toxin-Antitoxin Injections.* W. H. PARK. Proc. Soc. Exper. Biol. & Med., N. Y., 1919, 16, 116.

As previously reported, Park states that three injections of suitable toxin-antitoxin mixtures in diphtheria-susceptible children produced sufficient antitoxin in about 90 per cent to give a negative Schick reaction. In the remaining 10 per cent a second series of injections also produced immunity. The immunity had been found to last for 2½ years. Further work to determine if this immunity continues unabated shows that at the end of 3½ years it is as well developed as one year previously. The question of immunizing babies in this way who are passively immune through the antitoxin transmitted to them through the mother was investigated. The tests of the group in whom the proper time period had elapsed showed an immunity in 70 per cent, while untreated infants of the same age (8 months) only showed 30 per cent immune. These favorable results lead the writer to hope for complete success as greater knowledge is gained on the subject. Almost no local or general reaction occurs in small children or infants in contradistinction to adults, following the injections.—L. W. F.

441. *Les leçons de la guerre et les nouvelles vues dans le domaine de l'immunisation thérapeutique.* (Lessons of the War and Newer Views in Therapeutic Immunisation.) ALMROTH E. WRIGHT. Presse méd., Par., 1919, 27, 445.

A detailed and clear account of the author's views on the nature of immunity and its application, based on studies of infected wounds and their healing and artificial antityphoid immunity.—L. A. K.

442. *Zur Frage der Typhus- und Choleraschutzimpfung.* (The Question of Protective Inoculation Against Typhoid Fever and Cholera.) E. FRIEDBERGER. Ztschr. f. Immunitätsforsch. u. exper. Therap., Jena, 1919, 28, 119-185.

Friedberger presents an analysis of statistical data, collected during the war, to answer the question whether the records prove the success of inoculation against typhoid fever and cholera.

In the recent war, the successful campaign against infectious intestinal diseases was undoubtedly a triumph of the medical profession. This favorable result is attributable to several causes, to protective inoculation and to the thorough sanitary precautions which were more far reaching than in any previous war. The perfected sanitary and improved hygienic arrangements for troops during the recent war can be considered as important a factor in the decreased incidence of typhoid fever and cholera as protective inoculation.

Insufficient attention has been paid to the epidemiology of typhoid fever in critiques upon the value of vaccination. Statistics of the civil population show a steady decrease of the incidence of typhoid fever from 1870-1914. Improved civil sanitation is probably the chief cause of this, as inoculation against typhoid fever was not begun in the army until 1910-1914.

As in 1870, the army of 1914 suffered from an increase of typhoid fever during the first four months of the war. Intensive vaccination was begun about December, 1914. In some units of the army a decrease in the incidence of typhoid fever began before vaccination. In the German army of 1870, there was a similar spontaneous decrease of typhoid fever after the fourth month of the war. In 1870, the number of cases of typhoid fever was ten fold the number in the army of 1914 during the first month of the war. The decreased incidence of the disease in 1914, is related to the decrease in typhoid fever among the civil population, and is not apparently due to vaccination.

In long continued wars, there occurs a natural decrease in the incidence of typhoid fever and cholera among the troops. Statistics from the armies of the American Civil War and English and French Armies bear this out.

Friedberger concludes that it is illogical to attribute the reduction of incidence and mortality in typhoid fever and cholera chiefly to inoculation against these diseases. The statistics of the recent war point to improved hygiene and sanitation as being equally important factors as vaccination.

On experimental grounds, it has not been proved that the injection of dead bacilli, composing the vaccine, produce an immunity against the spontaneously arising disease. The bactericidal bodies which are produced by treatment with dead bacteria cannot be the origin of immunity.—S. B-J.

443. *Zur Typhusschutzimpfung des deutschen Feldheeres. (Typhoid Prophylaxis in the German Army.)* P. MUSEHOLD. Deutsche mil.-ärztl., Ztschr., Berl., 1918, Nos. 19-20; Schweiz. med. Wchnschr. 1920, 1, 17.

In spite of increasing unfavorable conditions, as evidenced by an increase in the incidence of dysentery, the morbidity from typhoid decreased with the progress of prophylactic inoculation from 2.1 to 0.6 per cent. The vaccination appeared to be effective for 6 months. During this period 2.1 per cent of those infected died, as compared with 10.1 per cent during the second 6 months. Vaccine which had been killed by heating to 53°-55°C. gave better results than that which had been heated to 60°C. The vaccine was polyvalent.—G. H. S.

444. *Recherches expérimentales sur la vaccination antityphique (étude sur les variations du pouvoir immunigène du para B). (Experimental Investigations of Anti-typhoid Immunization (a Study on the Variations in Immunizing Power of B. paratyphosus B).)* A. DUBURT. Thesis, Univ. Paris, 1919. Presse méd., Par., 1919, 27, 550.

Vaccines were prepared in several ways from a stable strain of *B. paratyphosus* B, and injected in large doses in guinea pigs, which were bled at the end of 18 days. Agglutinins appeared in the serum at the time of infection, increased with its accentuation, and disappeared progressively as immunity was established. From this it is concluded that the less agglutinogenic a vaccine, the less injurious it will be. A vaccine is active, however, in proportion to its antigenic value for lysins. An optimum killing temperature exists for each organism with respect to this ability; for paratyphoid B, this temperature is 90° for 2 minutes. Among the chemically killed vaccines, those prepared with ether were best. The toxicity of a vaccine, which must also be considered, varies with the medium, and can only be determined empirically.—L. A. K.

445. *Ueber Ruhrschutsimpfung. (Dysentery Prophylaxis.)* WILH. HOFFMANN. Deutsche mil.-ärztl. Ztschr., Berl., 1918, Nos. 13-14; Schweiz. med. Wchnschr., 1920, 1, 17.

Conclusions as to the exact prophylactic value of "dysbakta" are not yet available. The use of the vaccine, however, did not have any effect on the control of an epidemic of dysentery at a concentration depot. No final results have yet been recorded with regard to the efficiency of the phenol-killed vaccine of Dittthorn and Lowenthal.—G. H. S.

446. *Experiences with Our Multivalent Protective Dysentery Vaccine "Dysmosil."* FRITZ DITTHORN AND WALDEMAR LOEWENTHAL. Hyg. Rundschau, Berl., 1918, 23, 517-521.

The vaccine contains organisms of both the Shiga-Kruse and Flexner-Y groups. It is shown that the vaccine is well tolerated, it being injected in over 11,000 individuals. Immunity is attained rather slowly; about 2 or 3 weeks after the last dose of vaccine is given. The duration of the immunity is from 2 to 8 months. The vaccine retains its properties for a long time (at least 2 years). (Chem. Abstr.)—G. H. S.



447. *The Antigenic Properties of the Pfeiffer Bacillus as Related to its Value in the Prophylaxis of Epidemic Influenza.* CHARLES W. DUVAL AND WILLIAM H. HARRIS. *J. Immunol.*, Balt., 1919, 4, 317-330.

During the influenza epidemic of 1918 in New Orleans the authors vaccinated about 5000 people with a *B. influenzae* antigen. The vaccine was prepared from blood agar cultures which were from 36 to 48 hours old. The bacilli were killed with chloroform and the vaccine used within a few days after its preparation. A pre-epidemic strain (Wollstein) of *B. influenzae* was used to make most of the vaccine. Three injections at 3-day intervals was designated as complete vaccination. The doses ranged from 500 million to 1 billion organisms. The inoculations were, in a majority of instances, followed by both local and general reactions, but the symptoms subsided within a few hours.

Complete vaccination (3 injections) of 39.8 per cent and 48 per cent, respectively, of two groups of people gave 100 per cent protection, while more than 30 per cent of those refusing vaccination developed influenza. Among those receiving only one or two inoculations 15 per cent and 3.3 per cent, respectively, contracted the disease. The disease was prevalent in both groups when the vaccination was carried out. The vaccinated developed specific agglutinins and complement-fixing antibodies. The protection lasted from 2 to 3 months.—C. G. B.

448. *Experimental Streptococcic Tonsillitis: The Apparent Inefficacy of Streptococcic Vaccine as Prophylactic.* DE WAYNE G. RICHEY. *J. Infect. Dis.*, Chicago, 1919, 25, 299-305.

An account is given of the results of three investigations, carried out by medical officers of the U. S. Navy and Public Health Service. The purpose was primarily to shed some light on the spread of influenza, but only cases of tonsillitis are here considered.

One experiment was conducted in San Francisco in 1918 and two at Boston, one in the fall of 1918 and the other early in 1919. The material for experimentation consisted of 155 healthy volunteers from the enlisted personnel of the United States navy. No volunteer receiving filtered nasal or bronchial secretions from the sick showed any ill effects. Of the men receiving crude nasopharyngeal or bronchial secretions from the sick, 16 developed tonsillitis apparently due to hemolytic streptococci. The material used for instillation into the noses of the volunteers was obtained from early, acute, typical, uncomplicated influenza cases, except in one instance, when an early influenza suspect turned out to be a case of tonsillitis. The hemolytic streptococci found in the 16 cases of tonsillitis were similar to those isolated from the nasopharyngeal washings and bronchial secretions of the respective groups of donors. Three of the cases of tonsillitis occurred in persons who had received 1 month previously, a vaccine containing, in addition to other organisms, 3 presumably adequate doses of hemolytic streptococci, the strains employed having been isolated a short time before from the upper air passages of 2 influenza patients.—I. W. P.

449. *L'inoculation cutanée de vaccine est-elle suivie d'infection générale? (Is the Cutaneous Inoculation of Vaccine Followed by Generalized Infection?)* M. HENSEVAL. *Compt. rend. Soc. de biol.*, Par., 1919, 82, 873.

The experiments were conducted upon rabbits. At varying intervals (4 hours to 6 days) after the application of the vaccine the vaccinated areas were removed, and after a further period of 15 to 17 days the animals were again tested for susceptibility to the vaccine. It was shown that the primary vaccination does not alter the susceptibility of the animal unless it remains in the tissues more than 3 days. That is, for the first three days the infection remains localized.—G. H. S.

450. *La vaccination par injection de cow-pox chauffé. (Vaccination with Heated Cow-pox Vaccine.)* M. HENSEVAL. *Compt. rend. Soc. de biol.*, Par., 1919, 82, 889.

Heating at 50°C. for 30 minutes of vaccine solutions (1:100) strongly weakens the vaccine; at 55° some of the material remains viable; and at 58° to 60° the vaccine is entirely destroyed. The immunizing value of vaccine heated to 60 to 70° was tested. Eighteen days after the application of such heated vaccine a revaccination with living vaccine was given. The experiments showed that vaccine heated to 58° to 60° conferred an immunity; that heated to 70° failed to protect against the second injection.—G. H. S.

451. *Vaccinothérapie intensive dans le rhumatisme blennorrhagique. (Intensive Vaccinotherapy of Gonorrheal Rheumatism.)* A. SÉZARY. *Compt. rend. Soc. de biol.*, Par., 1919, 82, 1111.

It is quite generally recognized that gonococcus vaccines are to a degree efficacious, but that they are very inconstant in their action and fail to bring about complete cure in many cases. Dosage is an important factor in effecting cure. Thus, a lipovaccine was employed, excellent results being secured. Four to 5 cc. of the vaccine, containing in all 60 to 80 thousand million organisms, must be given. This material is given in 4 to 6 injections.—G. H. S.

452. *Beobachtungen über Partialantigene. (Observations on the Use of the Partial Antigen.)*, BRECKE. *Ztschr. f. Tuberk.*, Leipz., 1919, 30.

Report of the treatment of 100 cases. A statistical study of the results would indicate that the treatment has no striking therapeutic action. However, a large number of individual cases are mentioned as having been benefited. (Cor.-bl. f. schweiz. Aerzte.)—G. H. S.

453. *Erfahrungen mit Tuberkulinbehandlung. (Experience with Tuberculin Treatment.)* P. DENK. Ztschr. f. Tuberk., Leipz., 1919, 30.

A report on 83 cases treated with tuberculin O. T., B. E., or Bereneek's tuberculin. In all cases, aside from those with high fever and rapidly progressive extension, a definite beneficial result was secured. Tuberculin B. E. is best for the initial treatment, followed by the use of O. T. (Cor.-bl. f. schweiz. Aerzte.)—G. H. S.

454. *Tuberculin "M." The Ideal Tuberculin for the Treatment of Tuberculosis.* R. W. ALLEN. Brit. J. Tuberc., 1919, 13, 170-173.

The author endeavored to produce a tuberculin which would induce the formation of antitoxins as well as bactericidal and lytic antibodies. As a base he employed AF (albumose-free) because of its content in products of bacillary growth, (1) exotoxin, if any is formed; (2) endotoxin, liberated by autolysis; (3) small quantities of broken down bacillary protoplasm. Extracts obtained by the use of alcohol, ether, chloroform or combinations of these had no therapeutic value and were absorbed with extreme slowness.

After experimentation the following process was adopted: heat the bacilli with various solvents to remove fats and wax; dry and weigh; oxidize and hydrolyze them with dilute hydrogen peroxide until only insoluble residue remains; neutralize; dilute with normal saline solution containing 0.3 per cent tricesol until 1 cc. equals 20 mgm. of original dry bacilli; mix equal parts of this dilute tuberculin and AB.

The dose is from 0.0001 cc. to 0.001 cc. and gives a mild focal reaction. The author claims this tuberculin to be safe, and to have antigenic value far superior to other tuberculins.

Through a mistake by an assistant, a patient was given 20 million living sensitized bacilli, (sensitized with patient's own serum prepared for another purpose). The reaction was a slight rise in temperature, malaise, enlargement of axillary glands, which subsided. From this he concludes "living sensitized tubercle bacilli are relatively harmless but are too slowly absorbed to be of value as an antigen."—C. P. B.

## NON-SPECIFIC THERAPY

455. *Studies in Protein Intoxication. IV. Histologic Lesions Produced by Injections of Peptone.* T. HARRIS BOUGHTON. J. Immunol., Balt., 1919, 4, 381-384.

Fourteen guinea pigs were given a number (an average of 5 injections) of intraperitoneal injections of peptone. The first injection was 0.6 grams per kilo and the subsequent injections were gradually increased to the point of tolerance, 2 grams per kilo usually being fatal. The gross autopsy findings were very similar to those observed in animals dying of acute anaphylactic shock. A microscopic study revealed definite lesions in the kidney, liver and lungs. The chief lesions were swelling, degeneration and necrosis of the parenchymatous tissues; round cell infiltrations and swelling of the walls of the small arteries and proliferation of the endothelial cells of these vessels. It is pointed out that these lesions, both gross and microscopic, are practically identical with the lesions observed in animals poisoned with native proteins.—C. G. B.

456. *Ueber die Behandlung akuter Infektionskrankheiten (Typhus, Sepsis) mit intravenösen Injektionen von Bakterien-Impfstoffen. (The Treatment of Acute Infectious Diseases (Typhoid, Sepsis) with Intravenous Injections of Bacterial Vaccines.)* F. KALBERLAH. Therap. Monatsh., Berl., 1918, No. 9.

Excellent results were secured in the treatment of severe cases of typhoid fever by the intravenous injection of typhoid vaccine. The reaction was not specific, since similar results were secured with colon vaccine, gonococcus, and staphylococcus vaccines, dueteroalbumose, milk, and normal horse serum. Cases of streptococcus sepsis were treated with a variety of compounds and with typhoid vaccine with good results. (Cor.-bl. f. schweiz. Aerzte.)—G. H. S.

457. *Serum Therapy of Scarlet Fever.* W. GRIESBACH. Therap. Monatsh., Berl., 1919, 33, 22.

A study of 21 cases. Human serum was injected, in 19 cases from convalescents, in 2 from normal individuals. Ten to 20 cc. were given each patient. The treatment is very efficient in modifying the duration and severity of the disease. The reactions following the serum injections are dangerous. (Chem. Abstr.)—G. H. S.

458. *Therapy of Pulmonary Tuberculosis.* P. NOLF. Bull. Acad. roy. de méd. de Belg., Brux., 1919, 29, 327-343.

A 10 per cent peptone solution dissolves 1 to 3 per cent of  $\text{Cu}(\text{OH})_2$  and such a "copper peptonate" solution containing 1 per cent of  $\text{Cu}(\text{OH})_2$  mixes in all proportions with human serum without precipitation. One cubic centimeter injected intravenously every 2 to 4 days rendered patients afebrile. Patients also tolerate intravenous doses of dead tubercle bacilli of the order of magnitude used in the therapy of other infections, a treatment which seems effective in all but severe cases. (Chem. Abstr.)—G. H. S.

459. *Vaccination contre le virus charbonneux avec des substances non spécifiques. (Vaccination against Anthrax with Non-specific Substances.)* T. TURRÓ. *Compt. rend. Soc. de biol., Par.*, 1919, 82, 1085.

The addition of small amounts of ammonia to egg renders the material, which without the ammonia is an excellent culture medium, actively bacteriolytic for *B. anthracis*. Rabbits thoroughly immunized against this material offer an increased resistance to anthrax infection.—G. H. S.

## EXPERIMENTAL INFECTION

(See also Number 369)

460. *The Production of an Acute Respiratory Disease in Monkeys by Inoculation with Bacillus influenzae.* FRANCIS G. BLAKE AND RUSSELL L. CECIL. *J. Am. M. Ass.*, Chicago, 1920, 74, 170.

*Bacillus influenzae* can initiate in monkeys an acute infection of the respiratory tract. This infection may be complicated by acute sinusitis, tracheobronchitis and bronchopneumonia. This disease seems to be identical with influenza in man. *B. influenzae*, when injected intratracheally in monkeys, produces a tracheobronchitis and bronchopneumonia, the pathology of which appears to be essentially identical with that which has been ascribed to pure influenza infection in the lungs of man. The authors conclude that *B. influenzae* is the specific cause of influenza.—P. G. H.

461. *The Dissemination and Destruction of Typhoid Bacilli Injected Intravenously in Normal and Immune Rabbits.* RUTH LOVILLA STONE. *J. Infect. Dis.*, Chicago, 1919, 25, 284-298.

A review of the literature on this subject is given.

The two chief points under investigation were: (a) the difference, if any, between normal and immune rabbits in regard to the length of time required for the organs to become sterile following intravenous injection of living typhoid bacilli; and (b) the factors responsible for such a difference.

It was found that in normal rabbits typhoid bacilli could be isolated from the organs at least 10 days after their intravenous injection, while in typhoid immune rabbits they were usually gone in less than 24 hours, leaving the organs sterile. The immune rabbit serum proved non-bactericidal for typhoid bacilli *in vitro*, although normal rabbit serum was highly bactericidal. On the other hand, fresh immune serum was highly bactericidal *in vivo*, while normal serum was ineffective. Macerated organs, cut sections or extracts of organs, taken from immune animals, showed no bactericidal properties even when mixed with fresh immune serum, typhoid bacilli showing as good growth in such mixtures as in any other good medium, this despite the fact that in the living immune animal the bacteria appear to be destroyed in the organ.

The findings seem to indicate that the destruction of typhoid bacilli in the immune animal is due either to some interaction between the tissue cells and plasma *in vivo*, or to some other factor which has thus far been overlooked.—I. W. P.

462. *The Pathogenicity of Bacillus influenzae for Laboratory Animals.* H. ALBERT AND S. R. KELMAN. *J. Infect. Dis.*, Chicago, 1919, 25, 433-443.

Two strains of Gram-negative, small, non-motile, hemoglobinophilic bacilli, considered to be *B. influenzae*, isolated from sputum during the recent epidemic of influenza were used in tests of pathogenicity for rabbits, dogs, guinea pigs and mice. Suspensions of the bacteria from 24-hour growth on oleate-hemoglobin agar and broth were injected subcutaneously, intravenously and intraperitoneally into the animals. The bacterial suspensions caused the death of guinea pigs, rabbits and mice. Two cubic centimeters of a 24-hour hemoglobin broth culture of the bacteria were fatal to 90 per cent of white mice; 5 cc. of such a culture killed 50 per cent of rabbits and 70 per cent of guinea pigs tested. Death followed intraperitoneal or intravenous injection in 1½ to 30 days. Secondary infections were found to be common after the fifth day.

Mandler filtrates of 24-hour cultures in oleate hemoglobin and veal infusion broth were found to be toxic for these animals, confirming the work of Parker on the rapid production of a soluble toxin by *B. influenzae* in broth cultures.

The literature on the pathogenicity of *B. influenzae* is reviewed.—S. B.-J.

463. *Beiträge zur experimentellen Fleckfieberinfektion des Meerschweinchens. (Contribution to the Experimental Typhus Fever Infection of Guinea Pigs.)* R. OTTO AND DIETRICH. *Centralbl. f. Bakteriol. (etc.)*, Jena. I. Abt. Orig., 1918, 83, 383-400.

Guinea pigs are relatively susceptible to infection with typhus virus. However the clinical picture of the disease is not always significant, and the course may be disturbed by mixed infection. The course of the fever and the macroscopic findings are not sufficient to establish the presence of the disease.—R. E. B.

464. *Action de la staphylotoxine sur le lapin. Influence de l'age des animaux. (Action of Staphylotoxin on the Rabbit. The Effect of the Age of the Animals.)* LE FEVRE DE ARRIC. Compt. rend. Soc. de biol., Par., 1919, 82, 1313.

For the production of the staphylotoxin the organisms are cultivated on chocolate agar, for 24 hours, emulsified in normal salt solution, and held at 37° for 1 to 2 hours. After centrifugation the material is filtered. Such toxins are active when injected into rabbits, 5, 3, or even 1 cc. causing death in a few minutes when injected intravenously. Guinea pigs are less susceptible. The red blood cells of the rabbit are 500 times more sensitive to the staphylolysin than those of the guinea pig. Young rabbits are far more resistant to the staphylotoxin than are adult animals.—G. H. S.

465. *Experimental Gastric and Duodenal Ulcer.* A. C. IVY. Am. J. Physiol., Bost., 1919, 49, 143-144.

Typical chronic ulcers were produced experimentally in cachectic dogs by making lesions of the pyloric and duodenal mucous membranes and then feeding them on cultures of virulent streptococci. Healthy animals gave negative results. The etiology of chronic gastric ulcer is, therefore, probably the implantation of bacterial forms swallowed with the food. This condition occurs when the mucous surfaces present an abrasion and when the general resistance is lowered with hypoauidity. (Physiol. Abstr.)—G. H. S.

466. *Preliminary Note on the Apparent Transmission of Leprosy to a Macaque Monkey.* BURTON BRADLEY. Med. J. Australia, Sydney, 1919, 6th year, 2, 414-416.

The material was obtained from a non-ulcerated lesion on the eyebrow of a leper. This material stained showed enormous numbers of lepra bacilli. Efforts to cultivate it were not successful as the cultures were all contaminated.

A small portion of the material was inoculated through an incision into the muscles of the buttock, and two pieces subcutaneously, one about two inches from the first inoculation, the other over the right breast. The three wounds healed without swelling or inflammatory change.

About ten weeks later, small nodules were found at the sites of inoculation. Smear preparations were made from the nodules by means of needles, all showed lepra bacilli.

The animal was found dead three hours after the smear preparations were made. Post mortem examination showed lepra bacilli at the sites of inoculation as noted before, in both axillary glands, in the left inguinal gland and spleen. No pus was found in any of the lesions, however, in one of the lesions in the buttock, there was a small area of necrosis. The changes in the inoculated areas were essentially granulomas.—C. P. B.

## CHEMOTHERAPY

(See also Number 254)

467. *The Effects of Intravenous Injections of Dichloroethylsulfide in Rabbits, with Special Reference to its Leucotoxic Action.* A. M. PAPPENHEIMER AND M. VANCE. J. Exper. M., Balt., 1920, 31, 71.

Dilute alcoholic suspensions of dichloroethylsulfide (distilled from a German yellow cross shell) injected intravenously into rabbits in doses of from 0.005 to 0.01 gram per kilo produced a marked leucopenia with almost complete disappearance of the polymorphonuclear cells, accompanied by destructive changes in the bone marrow as evidenced by an almost complete absence of nucleated red cells and by degeneration of the megacaryocytes and of the leucocytes of the granulocyte series, and sometimes cytolysis in the follicles of the spleen and in the lymphocytes of the thymus and intestinal lymphoid tissue. Extensive capillary hemorrhages and edema of the lungs and not infrequently a severe diphtheritic enteritis also occurred. No significant changes were noted in the liver or kidneys.

In those cases which recovered from the first injection, signs of regeneration appeared in the bone marrow and in the circulating blood. Dichloroethylsulfide injected intravenously appears therefore to be specifically poisonous for the hematopoietic tissues, the granular cells of the bone marrow being more sensitive than either the lymphoid cells or erythrocytes.—W. P. B.

468. *Selective Bacteriostasis in the Treatment of Infections with Gentian Violet.* JOHN W. CHURCHMAN. J. Am. M. Ass., Chicago, 1920, 74, 145.

The paper reports the selective bacteriostatic power of gentian violet in the treatment of infected wounds. The activity of the dye is described as bacteriostasis, the dye is called a bacteriostat, and its property is referred to as bacteriostatic, partly because these words are etymologically correct and particularly because they describe the action of the dye with accuracy. It is true of gentian violet that apparent death of organisms, following exposure to the dye, may turn out to be only delay of growth. The power of the dye to prevent growth may be of equal importance with its power to kill organisms. The fact that the power of a therapeutic agent to prevent the growth of organisms may be as important as its power to kill is one reason why the custom of estimating the value of a bactericidal agent by its phenol coefficient alone is a pernicious one. Gentian violet possesses this power even in very high

dilutions, especially when this test is made *in vitro*. It would be unwise to assume that the selective activity exhibited *in vitro* should be as clear cut in wounds. In wounds as in test tubes the Gram-negative organisms are least affected. The organisms persisting in wounds which had been treated with gentian violet were *B. coli*, which are Gram-negative. All parts to be treated must be thoroughly cleansed and dried with gauze. They are then painted with a saturated aqueous solution of gentian violet. After this has dried a second coat is applied. After this has dried a dry dressing is applied. In two cases of amputated stumps that had become diphtheria carriers the treatment destroyed the diphtheria bacilli. In cases of infected stumps treatment with gentian violet greatly impeded even obstinate dermatitis. Four cases of infected stumps were treated successfully. Cases of ulcerative gingivitis were treated with gentian violet and their course was very satisfactory. The suggestion is made to inject the dye into the gums to reach organisms lying below the surface.—P. G. H.

469. *The Selective Inhibitory Action of Methylene Blue and Certain other Common Dyes on the Growth of Meningococci.* CARL A. L. BINGER. J. Infect. Dis., Chicago, 1919, 25, 277-283.

This study was undertaken in the hope of finding a chemical therapeutic agent suitable for use in meningococcus infections, especially those which, because of late diagnosis, are not amenable to serum treatment.

It was found that growth of meningococci *in vitro* was inhibited when the organisms were incubated one hour in dilutions of gentian violet, crystal violet, brilliant green, bismarck brown, safranin and methylene blue, the effective dilutions varying from 1/1000 to 1/40,000, according to the dye used and the strain of meningococcus employed. Basic fuchsin, vital red, fluorescein and eosin had no inhibiting action. Methylene blue, a relatively nontoxic dye, inhibited the growth of meningococci and also of gonococci in dilutions which were ineffective against *B. typhosus*, *B. coli*, *B. dysenteriae*, *B. pyocyaneus*, *Staphylococcus albus*, *Streptococcus viridans*, *Streptococcus hemolyticus*, *B. diphtheriae* and pneumococcus Type III. The inhibitory action of methylene blue on meningococci was dependent not only on the concentration of the dye, but on the number of organisms present, a thinner suspension being inhibited in dilutions 6 times greater than that observed in suspensions 10-fold heavier. For a given suspension, however, the inhibitory point was constant.

Methylene blue was found to have the same inhibitory effect on meningococci as formaldehyde, but far less effect than mercuric chloride, while phenol was ineffective even in 1:1000 dilution. The presence of the native protein of inflammatory cerebrospinal fluid did not interfere with the inhibitory action of methylene blue on meningococci. It is noted that the selective inhibitory action of methylene blue on the growth of meningococci *in vitro* may be of a specific chemical nature or may be non-specific and due merely to the relative frailty of this organism in artificial culture, but the results obtained suggest that its trial as a therapeutic agent in cases of meningitis might be worth while, provided due precautions are taken.—I. W. P.

470. *Comparative Toxicity of Triphenyl Methane and Flavine Dyes for Tissue and Bacteria.* JNO. H. MUELLER. J. Path. & Bacteriol., 1919, 22, 308.

In the preliminary experiments, the concentrations of various dyes which inhibit the growth of streptococci, staphylococci, *B. coli* and *B. pyocyaneus* broth were determined. The following results were found for the dyes most efficient as antiseptics:

For streptococci the dilutions in milligrams of dye per cubic centimeters of broth were in part as follows: Brilliant green, 0.00025; methyl violet 6-B, victoria blue, night blue and acriflavine, 0.0025; staphylococci, night blue, 0.0025; *B. coli*, crystal violet proflavine and acriflavine, 0.025; *B. pyocyaneus*, crystal violet and methyl violet, 0.025.

The proper method of treatment of a problem of this type, however, is to compare the relative action of the various antiseptics on tissues and bacteria. To accomplish this result, portions of chick embryo were suspended in Ringer's solution; sterile or inoculated with the dye in question and the tissue grown by Lambert's method using chicken plasma as a medium for culture. The results indicate that the triphenyl methane dyes show a definite specificity now for one, now for another type of organism. "Malachite green and brilliant green, closely related chemically, affect the streptococcus and colon bacillus. The two violets, probably the same chemical in different degrees of purity attack the colon and pyocyaneus, while the two blues, again closely related and quite distinct from any of the others, seem specific for Gram-positive organisms. The formation of addition products of the dye with a halide as in methyl green and iodide green seem greatly to reduce toxicity for all bacteria and sulfonation apparently quite destroys it."

In experiments with tissues, the various dyes showed greater toxicity for tissue than for bacteria; with the flavines, however, the inhibiting dilution is the same for tissue and streptococci indicating the possibility of better results with flavine than brilliant green in wound dressings. "In every case, a greater concentration of dye is necessary to inhibit bacterial growth in the presence of serum and tissue than in plain broth."

The original article should be consulted for the experimental data.—W. C. M.

471. *Zur Behandlung von Diphtheriekeimträgern mit Morgenroth's Chinaalkaloiden.* (*The Treatment of Diphtheria Carriers with Morgenroth's Quinin Alkaloids.*) W. PFEIFFER. Berl. klin. Wehnschr., 1918, No. 40.

Good results were secured in the treatment of diphtheria carriers by local treatment with 0.5 to 1 per cent solutions of eucupin. If the solution was injected into the parenchymatous tissue of the tonsils the results were somewhat better than when surface applications were employed. For injection the material was used in dilutions of 1:10,000. (Cor.-bl. f. schweiz. Aerzte.)—G. H. S.

472. *Die Behandlung der septischen Erkrankungen mit Silberpräparaten.* (*Treatment of Septic Diseases with Silver Preparations.*) A. ALEXANDER. Therap. Monatsh., Berl., 1918, No. 10.

Eighty cases were treated with collargol or argatoxyl. Of this number 64 were improved or cured, the remaining 16 died. Of 32 cases with general sepsis treated with collargol 11 died. None of the 7 cases treated with argatoxyl died. (Cor.-bl. f. schweiz. Aerzte.)—G. H. S.

473. *Action des colloïdes métalliques sur le toxine diphthérique.* (*The Action of Colloidal Metals on Diphtheria Toxin.*) LE FÈVRE DE ARRIC. Compt. rend. Soc. de biol., Par., 1919, 82, 1143.

The effects of colloidal solutions of silver, gold, platinum, manganese and iron upon diphtheria toxin were noted. Under the conditions of the experiment the toxin was unaffected by colloidal silver, gold, or platinum but it was reduced in toxicity by the colloids of manganese and iron.—G. H. S.

474. *Abortion de la syphilis par les arsénobenzols employés dès la période d'incubation.* (*Abortion of Syphilis by the Use of the Arsenobenzols in the Period of Incubation.*) LOUIS FOURNIER AND L. GUENOT. Presse méd., Par., 1919, 27, 554.

The arsenobenzols, injected in 6 to 8 doses totaling 2 or 2.5 grams, from a few days to 2 weeks after exposure to known syphilis, have averted the disease in a number of cases, as determined by absence of clinical symptoms, negative Wassermann tests, and normal pregnancies.—L. A. K.

475. *L'Administration intraveineuse du cacodylate de soude dans la fièvre récurrente.* (*Intravenous use of Sodium Cacodylate in Recurrent Fever.*) J.-L. PÉTER. Presse méd., Par., 1919, 27, 615.

Cacodylate of soda in doses corresponding to 20 centigrams of anhydrous salt proved of great value, though less effective than neosalvarsan, which was not obtainable.—L. A. K.

476. *L'Iode en thérapeutique tropicale, spécialement contre la trypanosomiase.* (*Iodine in Tropical Therapy, especially in Trypanosomiasis.*) G. DANIEL. Presse méd., Par., 1919, 27, 492.

Iodine, especially in the form of "iodosalyl" has great value in filariasis, recurrent fever, and associated with arsenic, in sleeping sickness. "Iodosalyl" is prepared by dissolving 2 grams metallic iodine with 25 grams of salol in 100 grams of olive oil in the water bath. Intramuscular injections of 5 cc. per 80 kgm. body weight are used.—L. A. K.

## MISCELLANEOUS

477. *The National Research Council.* HENRY A. CHRISTIAN. South. M. J., Birmingham, 1920, 13, 3-4.

A general statement as to the organization and its purposes in promoting research in the various branches of science.—J. H. B.

478. *Urease and the Radiation-Theory of Enzyme Action.* H. P. BARENDECHT. Konin. Akad. v. Wetensch. te Amst., 1919, 21, No. 9.

Using the urease found in soy beans the writer tests his radiation theory of enzyme action which he mentioned first in 1904, in these same proceedings. Also he tests his theory on the experimental evidence brought forward by other investigators, and is able to show that certain differences heretofore considered to be experimental errors are accurate results, and in accordance with the radiation theory. The papers are too technical to be abstracted properly.

We are of opinion that minute differences in the results are so important that several theories can be built upon them, but for the present the radiation theory seems to be really useful to advance our knowledge of the difficult subject of enzyme action.—J. V.

479. *The Blood and Bone Marrow in Yellow Cross Gas (Mustard Gas) Poisoning. Changes Produced in the Bone Marrow of Fatal Cases.* E. B. KRUMBHAAR AND HELEN KRUMBHAAR. J. Med. Research, Bost., 1919, 40, 497-507.

Yellow cross or mustard gas exerts on the bone marrow a direct toxic action, which, by depleting the leucocytes of the circulation, has an important bearing on the inability to resist secondary infection that is found in that form of gas poisoning. This toxic action on the

bone marrow is shown, not only by small areas of necrosis, but by an inhibition of the regeneration process (chiefly of the leucogenetic series). Not only is the amount of regenerative hyperplasia inadequate to the severity of the process (as compared with the marrow hyperplasia of various acute infections), but also the quality is inferior, that is, the great majority of the hemopoietic cells present are of immature types.—A. C. E.

**480. *The Effect of Hypotonic and Hypertonic Solutions on Fibroblasts of the Embryonic Chick in Vitro.*** M. J. HOGUE. J. Exper. M., Balt., 1919, 30, 617.

Experiments with bits of chick embryo heart suspended on cover-slips in varying concentrations of Locke-Lewis solution (15 cc. of chick bouillon and 0.25 gram dextrose added to 85 cc. Locke's solution) and mounted on hanging drop slides enabled the author to study the effect of different concentrations of sodium chlorid on the growth of fibroblasts. She observed that in hypotonic solutions with a sodium chlorid content of 0.54 and 0.45 per cent growth was more rapid, probably due to demand for food, the rapidity of growth being accompanied by formation of more waste products, thus altering the medium and further stimulating movement; but subsequently causing such an accumulation of waste products and consumption of food material that the cells died, those nearest the explant dying first. In hypotonic solutions of 0.3 and 0.225 per cent NaCl content death was more rapid, due to sudden absorption of water, with swelling and vacuolization of the nuclei and cytoplasm and formation of vesicles in the mitochondria. But in hypertonic solutions of 1.2 and 1.5 per cent growth was slower than normal, since there was a greater amount of food material so that migration was less rapid and less waste products were formed, thus altering the medium little. In these the cells at the outer edge died first, those next to the transplanted tissue remaining alive the longest. The cells of normal growth were killed with hypertonic solutions of 1.8 and less so with 1.5 per cent NaCl content, the cells contracting, with formation of connective tissue fibrils. The author describes transparent "balloon-like structures" and "granular hills" in certain of the tissue cultures which she believes have something to do with adjustment of the tissue to its new medium.—W. P. B.

**481. *Toxic Necrosis and Regeneration of the Acinar Cells of the Pancreas.*** F. PARKER. J. Med. Research, Bost., 1919, 40, 471-476.

Toxins which cause lesions in the heart, liver, kidney and adrenal, cause similar lesions in the acinar cells of the pancreas, which heretofore have been overlooked. The acinar cells of the pancreas have great power of regeneration.—A. C. E.

**482. *Creatinine et creatine. (Creatinin and Creatin.)*** MARCELLE WAHL. Archiv. de méd. expér. et d'anat. path., Par., 1918, 28, 105-154.

The author gives a comprehensive review of the metabolism, estimation and physiological and pathological significance of creatin-creatinin elimination. A number of observations on these points are recorded, the Folin method being used.

Conclusions based on personal observations are as follows: In estimating creatinin (Folin method) the solutions should remain in contact for 10 minutes before dilution. After dilution to 500 cc. the examination must be made within the following 15 minutes because of the gradual fading of the color. When glucose is present the solutions should be in contact 15 minutes before dilution, but no longer than this since the color becomes more intense for from 6 to 8 hours. The presence of from 0.1 to 0.2 per cent acetone causes only a slight weakening of the color and is practically negligible if the solutions do not remain in contact more than 10 minutes. In estimating the total creatinin, hydrolysis at 117°C. for 15 minutes is preferable to hydrolysis in the water bath, much less time being required. The error of the method for creatinin varies between 0.5 to 1 per cent, for creatin the error less than 2 per cent.

Normal individuals on a milk-vegetable diet do not excrete creatin; on a meat diet creatin appears and the creatinin is increased. Inanition is accompanied by the excretion of creatin, non-utilization carbohydrates and acid intoxication being closely related, but it is possible for creatin to be excreted in the absence of acidosis. In cirrhosis of the liver a small quantity of creatin is eliminated, the amount increasing as the condition grows worse, and creatinin is diminished. In benign catarrhal icterus and in cancer without metastasis in the liver only a small amount of creatin is eliminated, while in cancer with hepatic metastasis considerable creatin is eliminated. In muscular fatigue creatinin excretion is augmented and diminishes after a period of rest.—C. G. B.

**483. *L'alcool benzylique dans la tuberculose expérimentale (in vitro).*** (Benzyl Alcohol in Experimental Tuberculosis (in vitro).) J. JACOBSON. Compt. rend. Soc. de biol., Par., 1919, 82, 1264.

Benzyl alcohol has a solvent action on *B. tuberculosis*. The organisms digested at 37° for 48 hours lose 75 to 80 per cent of their weight. Such organisms are less readily stained with carbol fuchsin. Sputum is liquefied by benzyl alcohol. The injection of small amounts of benzyl alcohol into tuberculous guinea-pigs does not produce a reaction, either local or general.—G. H. S.

484. *Studies in Bacteriological Sampling, and Disinfection of Bathing Suits and Towels.* C. G. GILLESPIE. Month. Bull. Calif. State Bd. Health, 1919, 18, 97-111.

A complete and thorough laundering process was found necessary to render bathing suits incapable of spreading disease. This process consisted of disinfection, washing, drying and storage in the order named. They found that for disinfection the suits and towels should be agitated in the disinfecting solution so that it could penetrate to every part of the suit. While 15 minutes was sufficient for adequate disinfection to take place, they suggest 30 minutes as more practicable. For towels a 15-minute contact period in a solution containing 300 to 400 p.p.m. of available chlorine was sufficient. After disinfection very thorough rinsing should take place. They find that two rinsings are probably sufficient. The laundering method consisted of rinsing and air drying. Plain air drying may be depended upon to make the final count satisfactorily low, provided undue contamination has not existed before.—F. W. T.

485. *Le sérum-sérique antihémorragique. (Anti-Hemorrhagic Serum.)* H. DUPOUR AND Y. LE HELLO. Presse méd., Par., 1919, 27, 553.

Mild anaphylactic shock in the human increases the coagulability of the blood. A suitable and effective therapeutic measure consists in subcutaneous injections of previously sensitized serum. Rabbits are injected with small quantities of anti-diphtheritic horse serum, and bled on the 21st day after the first injection. Clinically, the use of this serum has given excellent results in hemorrhage; 16 cases are here reported. In several of these, where coagulation time was determined by Hayem's method, it was markedly decreased after the injection. The serum-reactive symptoms are negligible. The use of normal rabbit serum does not give increased coagulability.—L. A. K.

486. *Quelques considérations sur les ferments. (Some Considerations in Regard to the Ferments.)* H. ROGER. Presse méd., Par., 1919, 27, 741.

A descriptive account of certain biological phenomena ascribed to enzyme action.—L. A. K.

## PATENTS

487. *Serums.* G. CREMONESE. British patent 128,883; March 19, 1919. Chem. Abstr., 1919, 13, 2974.

An antimalarial serum, applicable to other diseases, is obtained by subjecting horses or other animals to gradually increasing doses of Hg preparations until the limit of tolerance, manifested by stomatitis, is reached. The subject is then bled and the serum obtained in known manner and preserved in sealed tubes.—G. H. S.

488. *Lactic Acid.* A. P. H. DESBOROUGH, J. REILLY AND A. C. THAYSEN. British patent 128,687; April 20, 1919. Chem. Abstr., 1919, 13, 2879.

Lactic acid is formed by fermenting sugars, such as maltose, which may be obtained by the action of malt or molds upon cereals, chestnuts, acorns, etc., dextrose, sucrose, mannitol, raffinose, and arabinose, with a new type of lactic acid producing organism, *Bact. volutans*. This organism is found in sour mash, maize or other cereal meal, soil, carrots, and parsnips, and is identified by the size and the production of volutine. Technical details are mentioned.—G. H. S.

489. *The Production of Glycerol from Sugar by Fermentation.* J. R. EOFF, W. V. LINDER AND G. F. BEYER. J. Ind. Eng. Chem., 1919, 11, 842.

The results are given of investigations made by the United States Internal Revenue Bureau in working a process whereby glycerol was produced from sugar by fermentation. *S. ellipsoideus* was used in alkaline solution. (Chem. Abstr.)—G. H. S.

490. *Acetone, Alcohols, etc.* A. P. H. DESBOROUGH, J. REILLY, A. C. THAYSEN AND F. R. HENLEY. British patent 128,714; June 20, 1918. Chem. Abstr., 1919, 13, 2883.

In bacterial fermentation processes for the production of acetone, alcohols, etc., one or more volatile fatty acids or their salts are added to the mash. The yield is increased or modified.—G. H. S.

491. *Acetone; Alcohols.* A. P. H. DESBOROUGH, J. REILLY, A. C. THAYSEN AND F. R. HENLEY. British patent, 128,403; June 20, 1918. Chem. Abstr., 1919, 13, 2882.

In bacterial fermentation processes to produce acetone, together with butyl alcohol and other products the yield may be increased by adding HOAc or a soluble acetate to the fermenting mass. *Granulobacter butylicum* may be used to give principally acetone and butyl alcohol.—G. H. S.



## BOOK REVIEWS

492. *The Lactic Acid Bacteria*. S. ORLA-JENSEN. Mémoires de l'Académie Royale des Sciences et des Lettres de Danemark, Copenhague. 1919. Section des Sciences, 8me serie, t. V, no. 2. pp. 81-196, with 51 plates.

An exhaustive monograph with 51 fine plates of photo-micrographs of India ink preparations; based on the study of 330 strains. Jensen defines the lactic acid bacteria as including non-motile, non-spore-forming Gram-positive rods or cocci which ferment sugars chiefly to lactic acid. He has studied the protein and carbohydrate metabolism of these forms in considerable detail. He finds that the sugars are attacked directly without hydrolysing ecto-enzymes, the hexoses being split directly into lactic acid, while 6 molecules of a pentose form, 8 molecules of lactic and 3 of acetic acid. Dextro- and laevo-rotatory lactic acid are formed by separate enzymes and their relative proportions are of great diagnostic value. Sucrose and raffinose are correlated in availability, as are starch and glycogen, while gum arabic, erythritol, adonitol, dulcitol and inositol are very rarely utilized. The true lactic acid bacteria are incapable of breaking down amino-acids and require protein (in solution or colloidal form) or the entire complex of amino-acids therein contained. Hydrogen ions, and in less degree lactate ions, inhibit growth. Thermal resistance ranges are wide, pathogenic forms being destroyed below 60°C., while the common streptococci of milk will withstand 70° for 15 minutes; many others resisting 70° to 75° and one species sometimes a temperature of 85° for the same period.

The true lactic acid bacteria (no catalase, no reduction of nitrate, no surface growth in tab) are divided by Jensen into five genera; *streptococcus* (spherical forms, always forming dextro-lactic acid, generally thriving well in milk and poorly in yeast extract as a rule dividing in only one plane) 10 species described; *Betacoccus* (cocci, forming laevo-lactic acid or occasionally the inactive form, generally slime producing, thriving well in yeast extract but usually not in milk, frequently fermenting raffinose and salicin but rarely dextrin and never inulin or starch, low optimum temperature), 2 species; *Thermobacterium* (long rods, forming laevo or inactive lactic acid, usually breaking down casein actively and thriving in yeast extract, never fermenting pentoses and frequently failing to attack salicin, grow between 22° and 50°), 5 species; *Streptobacterium* (rods in chains, forming inactive or dextro-lactic acid, thriving well in yeast extract and as a rule in milk, always fermenting maltose and salicin and almost always lactose, maximum temperature 35° to 40°C.), 2 species; and *Betabacterium* (rods, almost always forming inactive lactic acid, thriving well in yeast extract but as a rule badly in milk, never fermenting considerable amounts of mannitol, inulin, dextrin, starch or salicin, having a comparatively small mannose fermentation), 3 species. *Betabacterium* and *Betacoccus* are distinguished from the other three genera by the fact that they produce appreciable amounts of gas and other by-products in addition to lactic acid. These two genera are characteristic of souring vegetable matter, particularly beets.

Two other allied genera are also described which differ from the "true" lactic acid bacteria in forming catalase, reducing nitrates and producing surface growth in stab culture; *Tetracoccus* (cocci dividing in two or three planes, forming dextro-lactic acid), 3 species; *Microbacterium* (very small rods, forming dextrolactic acid, thriving badly in yeast extract), 3 species.

Pure culture studies are briefly reported on the production of sour cabbage by the use of a species of *Betacoccus* and a species of *Streptobacterium* and on the ripening of cheeses by various species of *Streptobacterium*, *Streptococcus*, *Tetracoccus* and *Thermobacterium*.

The bio-chemical portion of this monograph represents a contribution of the highest value to our knowledge of the physiology of a puzzling bacterial complex. From a systematic standpoint it is less illuminating. The evidence for combining the streptococci and the Bulgarian bacillus group in one family is suggestive, but hardly conclusive; while as in previous communications Jensen appears entirely innocent of any knowledge of the principles of biological nomenclature or of any respect for the work of previous investigators. His genus *Betacoccus* is apparently *Leuconostoc* of van Tieghem, and his *Thermobacterium* is certainly *Lactobacillus* Beijerinck; while many of his specific names are merely confusing synonyms of perfectly valid names given by previous investigators.—C.-E. A. W.

SEP 2 1920

VOLUME IV

NUMBER 2

# ABSTRACTS OF BACTERIOLOGY

UNDER THE EDITORIAL DIRECTION OF THE  
SOCIETY OF AMERICAN BACTERIOLOGISTS

APRIL, 1920

EDITOR

A. PARKER HITCHENS



*It is characteristic of Science and Progress that they continually  
open new fields to our vision.—PASTEUR*

PUBLISHED BI-MONTHLY  
FOR THE SOCIETY OF AMERICAN BACTERIOLOGISTS BY  
WILLIAMS & WILKINS COMPANY  
BALTIMORE, U. S. A.

THE CAMBRIDGE UNIVERSITY PRESS  
FETTER LANE, LONDON, E. C.

Entered as second-class matter April 30, 1917, at the Post Office at Baltimore, Maryland,  
under the Act of March 3, 1879

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## ABSTRACTS OF BACTERIOLOGICAL LITERATURE

### CHARACTERIZATION AND CLASSIFICATION

(See also Number 654)

493. *Studies on the Classification of the Colon-Typhoid Group of Bacteria with Special Reference to Their Fermentative Reactions.* C.-E. A. WINSLOW, I. J. KLIGLER AND W. ROTHBERG. *J. Bact., Balt.*, 1919, 4, 429-503.

While this paper presents primarily the results of a detailed study of 160 cultures of colon-typhoid bacteria in the collection of the American Museum of Natural History, the review of the literature of the subject makes it difficult to adequately present the contents in abstract form. The most important items represented are concerned with the following: The primary group of colon-typhoid organisms may be sharply split into the lactose fermenters and the lactose non-fermenters. The non-fermenters are further subdivided into two subgroups distinguished by the presence or absence of the power to produce gas in glucose media. The organisms which fail to produce gas in either lactose or glucose are further subdivided into 4 subgroups, depending upon differences in fermentation reactions with other carbohydrates, alcohols, milk and by pathological and serological properties (Groups I, II, III, IV). The lactose fermenters are subdivided into 2 subgroups on the basis of differences in fermentation reactions, in final acidities, gas ratios, Voges-Proskauer reaction, motility, indol production and gelatin liquefaction (Groups V and VI). The value of carbohydrate fermentation tests as a basis for bacterial classification; the chemistry of the fermentative reactions of the colon-typhoid group; progressive changes of reaction in carbohydrate media and their significance are reviewed historically and critically discussed. Each of the 6 groups into which the authors divide the colon-typhoid organisms are discussed in detail. A review of the general characteristics of the species of the group presents in a single table and a single chart the essential characteristics of the more important forms. The bibliography contains about two hundred authors.—I. S. F.

494. *The Nomenclature of the Actinomycetaceae.* R. S. BREED AND H. J. CONN. *J. Bact. Balt.*, 1919, 4, 585-602.

A critical review of the literature pertaining to the description of organisms and the nomenclature of this group. Error, neglect and misunderstanding by earlier contributors to the literature and the rules of nomenclature have brought on a thorough state of confusion. The term *Streptothrix* Cohn (1875) should be disregarded. The term *Actinomyces* Harz (1877) is recommended, with *A. bovis* Harz as the type species. The use of the term *Nocardia* Trevisan for the organisms of this group appears unjustified.—I. S. F.

495. *On the Bacillus of Morgan No. 1—A Meta-Colon-Bacillus.* TH. THJØRTA. *J. Bact., Balt.*, 1920, 5, 67-77.

From 9 cases of severe diarrhea or dysentery-form colitis cultures of Morgan bacillus No. 1 were isolated. There was no evidence of the presence of other pathogenic organisms. The strains were serologically unrelated to typhoid, paratyphoid A and B, dysentery I, II, III, or colon bacilli or to each other. The sera of the patients failed to show the presence of specific agglutinins. After growth on artificial media for one and one-half years only 1 strain had retained motility, 2 had lost the faculty for producing gas in glucose media and had achieved the power of fermenting (producing acid) from mannitol and sucrose (resembling dysentery group). The Morgan bacillus is probably a type of *Bacterium coli* (metacolon). "... for the time being there is nothing to prove that the metacolon organism is more than a saprophytic colon bacillus, that thrives especially well in an inflamed intestine."—I. S. F.

496. *An Investigation of the Flexner-Y Group of Dysentery Bacilli.* H. S. GETTINGS. Med. Research Committee, Spec. Rep. Series, No. 30, 1919. (This paper was compiled for the press from the author's notes after his decease by S. R. Douglas.)

"The object of this work was to find to what extent bacilli of the Flexner-Y group could be subdivided into sub-groups by means of fermentation, agglutination, or absorption of agglutination. The conclusions are based upon the examination of 285 strains isolated from cases of asylum dysentery.

"It was found that no subdivision was possible upon a basis of fermentation even when a large series of sugars was used.

"Agglutination was carried out with two monovalent sera prepared from the author's strains. It was clear from these results that serological sub-groups did exist, but the reactions were too variable accurately to define the limits of these.

"The absorption of agglutinin tests were made with 95 different strains. By means of four monovalent sera selected from the series it was found possible to sub-divide 92 of these strains into four sharply defined sub-groups. Sub-group I contained 40 members, II 30 members, and III and IV 11 members each. The three strains remaining over could not be identified as falling into any of these sub-groups. Sub-group III probably corresponds to the 'Y' sub-variety of the Flexner Group." (P. F. in Med. Sci., Abs. & Rev., Lond., 1919, 1, 227.)

497. *Zur Kenntnis der Bakterien der "Faecalis-Gruppe."* (Observations on the *Faecalis* Group of Bacteria.) ERIK JOH. KRAUS AND E. KLAFTEN. Centralbl. f. Bakteriologie. (etc.), Jena. 1. Abt., Orig., 1918, 80, 291-303.

From 3 cases of intestinal disease (one typhoid, one paratyphoid A, one non-specific infection) organisms were isolated which were regarded as *B. faecalis alkaligenes* and which were agglutinated by the patient's sera.

From a case of inflammation of the gall bladder, a strain was obtained which produced a transient acidity in lactose and other sugar media, the final reaction being very alkaline. This strain is regarded as a connecting link between the colon and alkaligenes groups.—M. L.

498. *Zur Morphologie und Biologie des Bacillus suispestifer.* (The Morphology and Biology of *B. suispestifer*.) ALFRED TRAWINSKI. Centralbl. f. Bakteriologie. (etc.), Jena. 1. Abt., Orig., 1918, 80, 339-349.

Forty-two strains were obtained from the internal organs of 21 cholera infected hogs. They were identical morphologically, culturally and serologically. They differed from standard stock cultures of *suispestifer* only by their failure to ferment dulcitate and arabinose.—M. L.

499. *Zur Kenntnis einiger defektiver Coli-Formen.* (Some Atypical Strains of the Colon Group.) HEINRICH PRELL. Centralbl. f. Bakteriologie. (etc.), Jena. 1. Abt., Orig., 1918, 80, 226-242.

Strains which were regarded as atypical *B. coli* because they failed to form gas from lactose, suddenly acquired the property of fermenting this sugar. On growing *B. coli* and *B. typhosus* in the same tube the former was observed to lose its lactose fermenting property. Members of the colon and dysentery groups were made to lose or acquire fermentation characters by growing them in the presence of antiseptics or in mixtures with other organisms.—M. L.

500. *The Biological Classification of Influenza Bacilli.* T. M. RIVERS. Johns Hopkins Hosp. Bull., Balt., 1920, 31, 50-53.

The author's conclusions are: "1. The Gram-negative, non-motile, hemoglobinophilic bacilli can be classified biologically by reactions which admit of subdivision of the group. 2. In working with a suspected *B. influenzae* the following routine should be followed: (a) determination of hemoglobinophilic qualities; (b) colony formation; (c) hemolytic test; (d) Gram stain; (e) morphology; (f) motility; (g) indol formation; (h) reduction of nitrates to nitrites; (i) amylase formation; (j) reaction in blood-broth-milk. 3. *B. pertussis* can be differentiated from the group of *B. influenzae* by cultural characteristics."—F. W. H.

501. *A Contribution to the Bacteriology of a Fusio-Spirillary Organism with Special Reference to Its Life History.* RALPH R. MELLON. J. Bact., Balt., 1919, 4, 505-540.

Description of a fusio-spirillary organism isolated from a fatal generalised infection arising probably from the appendix. The organism has several forms, the branching filamentous ones relating it to the streptothrices, the bacillary and coccoid phases to the lower bacteria. The observations serve as the basis of a discussion of the evolutionary and involutionary methods of explaining biotypes. The observations indicate that filaments originate directly from granular diphtheroid forms and are cultivable in purity. The filterable forms of the organisms have been only partly studied but present many interesting aspects.—I. S. F.

502. *On the Spirochæta zeylanicus (Castellani).* FRANK E. TAYLOR. J. Path. & Bacteriol., 1919, 22, 262-284.

A report is given on the morphology, cultural properties and pathogenicity of a strain of *Spirochæta zeylanicus* which was isolated from the stools of patient having colitis.

The organism was found to be extremely pleomorphic. It was not pathogenic for rabbits or guinea pigs. It is pointed out that the organism might be mistaken for one of the typhoid-dysentery group because of the nature of the colonies on agar and special colored media and the absence of sugar fermentation.—C. G. B.

503. *Neue Mitteilungen über Verwandlungsfähigkeit, Paragglutination, etc., in der Ruhr-Typhus-Coli-Gruppe auf Grund experimenteller Beobachtungen II. Mitteilung: Beschreibung von Veränderungen in Kulturen des Bacillus Schmitz.* (New Studies on the Mutability, Paragglutination, etc., in the Intestinal Typhoid Colon Group on the Basis of Experimental Observations. II. Contribution: Description of Changes in Cultures of *Bacillus Schmitz*.) K. E. F. SCHMITZ. Centralbl. f. Bakteriologie. (etc.), Jena. 1. Abt., Orig., 1919, 83, 108-168.

The author gives an elaborate discussion of his proof of the mutability of the *Bacillus Schmitz*. As successive mutants from a typical *Schmitz* bacillus he succeeded in securing a

Shiga-Kruse bacillus, a mannite negative alkali former, a bacillus of the Mann type, a paratyphoid bacillus, a mannite fermenter that produced red secondary colonies on lactose, a colon bacillus showing paragglutination, and a bacillus X that was not cultivated in pure culture. In another case he succeeded in securing from a typical Schmits bacillus a bacillus of the Shiga-Kruse type, a paratyphoid B, and a typhoid bacillus. Every assurance is given of care in laboratory manipulation and of the purity of the original material. Studies were made of morphology, cultural and physiological characters. The conclusion reached is that it is entirely possible to observe the development of new forms by mutation in the laboratory.

—R. E. B.

504. *Neue Mitteilungen über Verwandlungsfähigkeit, Paragglutination usw. in der Ruhr-Typhus-Coli-Gruppe auf Grund experimenteller Beobachtungen. III. Mitteilung: Die Hypothese des Generationswechsels als Erklärung der Veränderungen in der Ruhr-Typhus-Coli-Gruppe. (New Contributions Concerning the Mutability, Paragglutination, etc., in the Dysentery-Typhoid-Colon Group on the Basis of Experimental Observations. III. Contribution: The Hypothesis of the Alternation of Generations as a Solution for the Changes Occurring in the Dysentery-Typhoid-Colon Group.)* K. E. F. SCHMITZ. *Centralbl. f. Bakteriol. (etc.), Jena. I. Abt., Orig.*, 1919, **83**, 210-227.

Single cell cultures of bacillus of Schmits retain completely their earlier characteristics. In only two strains could there be established any variation and this is serological in nature.

The bacillus of Schmits is widely distributed and should be considered a possibility in all cases of dysentery.

Studies in the Race I of Kruse showed that the forms not fermenting mannite are to be included under the heading of *Bacillus schmits*. The mannite fermenters are not dysentery bacilli but are metamorphosed forms.

In cultures of Schmits bacilli were found a series of related bacteria. These belonged to the following groups:

1. Dysentery group including Shiga-Kruse bacilli and pseudodysentery H bacilli.
2. The typhoid group including typhoid bacilli and paratyphoid B bacilli.
3. Colon group including *B. coli commune*, paragglutinable coli strains and strains of *B. coli mutabile*.
4. Bacteria not more accurately determined, including dysentery-like but not agglutinable forms, organisms of the *B. fecalis alcaligenes* type, and paratyphoid-like organisms which form indol.

These bacteria, it is contended, are not to be regarded as arising from impure cultures, for careful observation seemed to prove this to be impossible. They are to be regarded as having been derived from the bacillus of Schmits.

The changes observed are not fortuitous, but follow definite laws. They are not caused by external conditions but are the result of internal forces. They may be regarded as parts of a developmental cycle on the part of the organism.

Organisms of the dysentery-typhoid-colon group are potentially present in the original culture but the unfolding of their characteristics occurs only under a particular circumstance. This particular circumstance is to be regarded as the development of sexuality and perhaps the occurrence of conjugation. The various forms may therefore be regarded as representing steps in a complex generation cycle or alternation of generations. The various species belonging to this group are really not discrete, but simply the various steps in this developmental cycle, and remain unaltered as long as no sexuality intervenes. These forms belong to what may be regarded as a phenotype, not to a genotype. Genovariations have not thus far been certainly observed among the bacteria.

Agglutination is also to be regarded as a true phenotypic reaction and has nothing to do with idioplasm. It may be transformed with varying conditions. This alternation of generations hypothesis does not in any way interfere with the ordinary teachings of epidemiology. Just to what extent, however, pathogenic forms may develop from the non-pathogenic types is not as yet established.—R. E. B.

505. *Ueber die Aussalzbarekeit von Bakterien durch Magnesiumsulfat. (The Salting Out of Bacteria by Means of Magnesium Sulfate.)* E. GILDEMEISTER AND K. GÜNTHER. *Centralbl. f. Bakteriol. (etc.), Jena. I. Abt., Orig.*, 1919, **83**, 391-399.

Paratyphoid B bacilli can be differentiated, in general, from typhoid, paratyphoid A and usually from the other paratyphoid-like bacilli by salting out with magnesium sulfate. The differentiation of the paratyphoid B bacilli from the Gärtner, coli, and especially the *coli mutabile* strains is not readily carried out by means of salt agglutination. The numerous representatives of the last named three groups frequently show the same salting limits as the paratyphoid B.

In the group of the paratyphoid B bacteria the *B. suispestifer* occupies a special position, for it always requires the highest concentration of salt before it will flocculate out. The method does not give a satisfactory differentiation of cholera vibrios from the cholera-like vibrios. Dysentery bacilli are easily salted out, but a differentiation of the Shiga-Kruse, the Flexner and the Y bacilli is not possible, for their limits are for the most part the same. The dysentery bacilli described by Baerthlein give a completely negative reaction. The normal forms and variants of typhoid and paratyphoid B bacilli do not show the same salting



limits. The variants are for the most part more difficult to salt out than the normal forms. The significance of the salting out method, as suggested by Liefmann, is too slight for any practical utilization of the method in diagnosis.—R. E. B.

## BACTERIAL NUTRITION AND METABOLISM

506. *A Study of the Toxicity of Diphtheria Bacilli Isolated from Immediate Contacts.* F. W. HACHTEL AND M. S. BAILEY. *Am. J. Pub. Health, Concord*, 1920, 10, 42-44.

Ninety-seven per cent of the morphological *B. diphtheriae* isolated from contacts were toxic to guinea pigs, and 100 per cent of the virulent organisms produced acid from dextrose; 2 per cent produced acid from sucrose. The high percentage of toxic organisms isolated from convalescents and contacts would indicate these as the main sources of infection.—M. C. P.

507. *Studies of the Diphtheria Bacillus in Culture.* JOHN W. M. BUNKER. *J. Bact., Balt.*, 1919, 4, 379-407.

In respect to the problems of the reactions of culture media, the author presents the results of some experiments which very nicely bear out the growing tendency to study reaction by measurements of the concentration of hydrogen ions rather than of the titrable acid. The addition of Witte peptone to a veal infusion increases titrable acidity in proportion to the amount of peptone added. The concentration of hydrogen ions is, however, diminished. The decrease in acidity produced by the addition of standard alkali, when measured by the titration method, is proportional to the amount of alkali added. The depression of the hydrogen ion concentration produced at the same time is, however, regulated by the amount of peptone present. The influence of reaction upon growth can be accurately measured by the CH of the medium, but not by titration. The optimum initial reaction for growth (under conditions described) for *B. diphtheriae* is pH 7.0-7.5; and for the most rapid development of pellicle is pH 7.3-7.5. During the course of growth, if the medium contains a fermentable sugar the CH+ rises and then falls rapidly to a distinctly alkaline point—about pH 8.3. If no sugar is present the initial rise in CH is not observed. The production of toxin in the culture parallels, up to a certain point, the increasing alkalinity. Potent toxin is produced when the reaction of the medium lies in the zone pH 7.85-8.25. The pH of the medium rather than the time of incubation gives a reliable method of judging ripeness for toxin production. Preliminary experiments reported here indicate that a "polypeptide" medium gives toxin production results which are as satisfactory as those obtained with Witte's peptone.—I. S. F.

508. *Contributions to the Biochemistry of Pathogenic Anaerobes. VI. The Proteolytic Action of Bacillus sporogenes (Metchnikoff) and Bacillus welchii.* CHARLES G. L. WOLFE. *J. Path. Bacteriol.*, 1919, 22, 270-288.

The medium used in this study consisted of cooked meat in water (Robertson). Horse's heart furnished the meat, the hearts being cooked within a few hours after the animals were slaughtered. The initial composition of the medium was determined with respect to (1) total nitrogen, (2) ammonia-nitrogen, (3) amino-acid nitrogen, and (4) volatile acids. 1500 cc. quantities of the medium were then inoculated with a meat culture of the organism being studied and samples of the culture were removed at frequent intervals for analysis. Besides the points mentioned the analysis also included the quantity and composition of the gas produced in the culture. The author summarizes his observations as follows:

1. "In a medium consisting solely of sterilized muscle and water, both *B. sporogenes* and *B. welchii* grow with great rapidity. Both form large quantities of gas consisting of carbon dioxide and hydrogen. The amount of gas formed per litre of medium is apparently about equal with both organisms. With *B. sporogenes* about 70 to 75 per cent of the gas consists of carbon dioxide.

"Analyses of the gas from fermentations with *B. welchii* show a much smaller percentage of carbon dioxide, roughly about 38 per cent. The proteolytic power of *B. sporogenes* is very great, as much as 477 mgrms. of ammonia-nitrogen has been found in the filtrate from fermentation, while in the same liquid there were 237 mgrms. of amino-acid nitrogen.

"With the large amount of gas formed by *B. welchii* there is relatively little proteolysis. The chemical results thus confirm what one observes in cultures of *B. welchii*, namely, that the particles of meat do not tend to lose their original contour.

"What is of great interest in a comparison of these two organisms is the difference in their volatile-acid production. *B. welchii* which produces large quantities of volatile acids in carbohydrate-containing media, such as milk or glucose peptone, does not form any considerable quantity of acid with muscle tissue. On the other hand *B. sporogenes* is capable of forming acids in quantity in any medium, whether it contains carbohydrate or not."—C. G. B.

509. *Contributions to the Biochemistry of Pathogenic Anaerobes. VII. The Biochemistry of Bacillus proteus.* CHARLES GEORGE LEWIS WOLFE. *J. Path. & Bacteriol.*, 1919, 22, 289-307.

Strains of *B. proteus* isolated from war wounds were grown in (1) peptone water, (2) glucose peptone, (3) milk, and (4) cooked meat medium. The composition of the media was determined both before and after inoculation and incubation. The author summarizes his observations as follows:

"*B. proteus* grown upon various media does not exhibit any of the qualities of a putrefactive organism.

"It is a moderate gas former, the largest amount of gas being obtained in cultures of cooked meat. Compared with putrefactive organisms such as *B. sporogenes* and *B. histolyticus* its proteolytic activities are not great.

"The two strains examined attacked glucose. The analytical result gives a lactose consumption of 6.9 grams per litre.

"The volatile acid production is very small.

"In none of the experiments was a putrefactive smell noticeable, and no indol was produced under the most favorable circumstances for its development. *B. proteus* contains a powerful urea splitting ferment, being capable of transforming 45 per cent of the total nitrogen of urine into ammonia."—C. G. B.

510. *Contributions to the Biochemistry of Pathogenic Anaerobes. VIII. The Biochemical Comparison of Microorganisms by Quantitative Methods.* JOHN EDMUND GUY HARRIS. *J. Path. & Bacteriol.*, 1919, 23, 30-49.

Quantitative biochemical studies were made with 2 closely related organisms, *B. sporogenes* and the Reading bacillus. The organisms were cultivated in 4 different media (peptone water, glucose-peptone, cooked meat and alkaline egg) under the same conditions. The media were analysed before and after incubation and the metabolic products thus determined. The points noted were, (1) the amount of gas produced and percentage of CO<sub>2</sub>, (2) the amino-nitrogen, (3) the ammonia-nitrogen, (4) the sugar content, (5) the volatile acids, (6) the hydrogen-ion concentrations, and (7) the percentage of oxygen in which the organisms would grow.

Strikingly similar results were obtained with the two organisms except that *B. sporogenes* tolerated large amounts of oxygen in liquid medium while the Reading bacillus proved to be a strict anaerobe under all conditions. It is concluded that the two organisms belong to the same species.

The author describes in detail very simple and practical methods for determining the quantity of gas produced and the oxygen tolerance or aerobic index of bacteria. The need of quantitative studies in bacteriology is stressed.—C. G. B.

511. *Studies in the Metabolism of Actinomycetes. III. Nitrogen Metabolism.* SELMAN A. WAKSMAN. *J. Bact., Balt.*, 1920, 5, 1-30.

The Actinomycetes are not nitrifiers. Most species can reduce nitrates, this depending largely upon the source of available carbon. Proteins and amino acids but not amides are good sources of nitrogen. The utilization of both amides and ammonium salts depends upon the source of carbon available and upon the reaction of the medium. Excepting after continued incubation ammonia accumulation in the medium is unusually met with. Yellow and brown pigments are produced in media containing proteins and amino acids. Tyrosin is concerned in the pigment production of only a few of the strains studied. The formation of a brown pigment is generally accompanied by that of an oxidase. The period of incubation is important in determining the products of metabolism of these organisms.—I. S. F.

512. *Studies in the Metabolism of the Actinomycetes. IV. Changes in Reaction as a Result of the Growth of Actinomycetes upon Culture Media.* SELMAN A. WAKSMAN. *J. Bact., Balt.*, 1920, 5, 31-48.

The Actinomycetes appear to be unable to produce appreciable amounts of acid (as measured by final pH+) from carbohydrates. The course of the nitrogen metabolism, rather, results in changes in reaction which are observed. This is especially evident from a study of the utilization of NaNO<sub>2</sub> and NaNO<sub>3</sub>. With the former the medium tends to become alkaline; with the latter, acid. This difference, the author thinks, is explainable perhaps by the splitting off of oxygen from the nitrate to oxidize hydrogen and hence diminish the concentration of hydrogen ions. With the presence of ammonium salts of strong acids in the medium there is a tendency for acid production. The source of carbon and the initial hydrogen ion concentration largely influence the final reaction of media containing proteins and amino acids. With an available carbohydrate in a protein medium there is a tendency for the development of an acid rather than an alkaline reaction. This the author ascribes to influences upon the nature of the nitrogen metabolism rather than directly to acid production from the carbohydrate. There is a tendency for the organisms to produce changes in the media which will shift the reaction (acid or alkaline) towards an optimum.—I. S. F.

513. *Morphological Changes during the Growth of Bacteria.* PAUL F. CLARK AND W. A. RUEHL. *J. Bact., Balt.*, 1919, 4, 615-629.

Seventy strains of organisms representing 37 species selected from most of the recognized groups of pathogenic bacteria have been studied at brief intervals over the first 48 hours of cultivation and again at the end of a week. With the exception of the members of the diphtheria group and possibly the mallei group the organisms are larger in the early hours of incubation (4-9) than at the end of 24 or 48 hours. "In some instances the difference is so great as to render the organisms unrecognizable when viewed by the ordinary standard of the 24-hour culture." At this late hour most of them may be said to be in a stage of "senile



debility." The organisms are largest during that period in which rapid cell division is occurring. In the diphtheria group the senile forms only generally show the metachromatic bars and granules and are larger than the younger ones of the same or parallel culture.—I. S. F.

514. *Ueber Colitisbazillen. Ein Beitrag zur Bakteriologie der sogenannten Pseudodysenteria-bazillen. (Colitis Bacilli. A Contribution to the Bacteriology of the So-called Pseudodysentery Bacilli.)* WERNER LIESS. *Centralbl. f. Bakteriol. (etc.)*, Jena. I. Abt., Orig., 1919, 83, 193-210.

The dysentery bacilli should be separated into the true dysentery or Shiga-Kruse type and the colitis type including Flexner, Y and Strong forms. The term pseudodysentery should not be applied to the latter forms, the name colitis types being proposed instead. Under this designation he includes those Gram-negative non-motile rods that grow well on agar, produce no pigment and no liquefaction on Loeffler serum, milk is not coagulated, in litmus milk first acid then alkali, no gas from glucose or lactose, gelatin not liquefied, acid from mannite, but not from sucrose, colorless to rose colonies on Endo, neutral red not reduced but yellow in lactose shake cultures, indol formation and maltose fermentation irregular. Cultural and physiologic characters are of more importance than agglutination, for the agglutinin production is quite variable.

Colitis-like organisms may produce immediate alkaline reaction in litmus milk, or it may remain red.

Acid agglutination does not separate the various strains satisfactorily.

The colitis strains studied retain their characteristics even for months and years on ordinary agar both culturally and serologically. No evidence was obtained upon the biologic variability of bacteria.—R. E. B.

515. *Ueber choleraähnliche Vibrionen mit besonderer Berücksichtigung ihrer Mutationsvorgänge. (Cholera-like Vibrios with Particular Reference to Occurrence of Mutations.)* IGNATZ FELDMANN. *Centralbl. f. Bakteriol. (etc.)*, Jena. I. Abt., Orig., 1917, 80, 129-160.

Ten strains of cholera-like organisms were studied. On Ragit agar, mutations were observed, indicated by variations in the shape, size and opacity of the colonies. The organisms themselves sometimes become spindle shaped or develop long, irregular, thread-like forms.

Agglutination and complement fixation reactions are regarded of value for differentiating cholera-like vibrios. Eight types were indicated among the 10 cultures observed. Only the non-pathogenic type failed to show mutation. The question is raised as to whether mutation formation is an index of pathogenicity.—M. L.

516. *Untersuchungen über die Variabilität der Bakterien. VI. Mitteilung: Variabilität in der Typhus-Coli-Gruppe. (Studies on Variability of Bacteria. VI. Contribution. Variability in the Typhoid-Colon-Group.)* PHILIPP EISENBERG. *Centralbl. f. Bakteriol. (etc.)*, Jena. I. Abt., Orig., 1918, 80, 385-413.

Many changes in size, opacity and structure of colony, gelatin liquefaction, pigment production, and sugar fermentations were noted in variants in colon-typhoid group.

Exposure of *B. coli* for one and one-half hours to petroleum ether produced mutants which lacked the power of lactose fermentation. This characteristic held true for 20 generations.—M. L.

517. *Bakteriologische Untersuchungen über die Celluloseverdauung. (Bacteriological Studies on Cellulose Digestion.)* ANNA HOPFFE. *Centralbl. f. Bakteriol. (etc.)*, Jena. I. Abt., Orig., 1919, 83, 374-386.

The author reaches the conclusion that the cellulose digestion which occurs in ruminants is due to the activity of microorganisms but not to the activity of organisms ordinarily included under the heading of the normal intestinal flora. Certain of these species, however, are capable of bringing about slight cellulose fermentation under favorable conditions, although the ability to do this is rapidly lost upon cultivation and transfer. It is probable that cellulose digestion is due to the activity of microorganisms which have not thus far been described and which will require unusual or special methods to be devised for their cultivation. It is concluded that probably the protozoa which are so abundant in the paunch of ruminants do not contribute to the cellulose digestion.—R. E. B.

518. *The Effects of Acids, Alkalies, and Sugars on the Growth and Indole Formation of Bacillus coli.* FRANK JOHN SADLER WYETH. *Bio-Chem. J., Liverpool*, 1919, 13, 10-24.

The approximate limit of the initial reaction of peptone media in which *Bacillus coli* will grow either in the presence or absence of sugars is pH = 4.27 to 9.87. Any change in the initial reaction of the medium results in a change which is similar in direction, but smaller in magnitude in the final reaction of the culture. This indicates that the final reaction is not a physiological constant as was suggested by Michaelis and Marcora. When *Bacillus coli* was grown in 2 per cent glucose peptone, with the initial reaction of the medium varying from pH = 4.3 to pH = 5.82, the final reaction varied only between pH = 4.27 and 4.82. When the organism is grown in 2 per cent peptone, however, the initial reaction of the medium varying from pH 4.3 to 9.37, the final reaction varied between pH = 5.92 and pH = 8.55. The fermentation of the sugar renders the culture more acid than the original medium. The

proteolytic fermentation in 2 per cent peptone causes the increase in final alkalinity in the resulting culture, unless the initial reaction lies between the alkaline limiting values pH = 9.37 and pH = 8.48, in which case the final reaction of the culture is less alkaline. Sugar fermentation in 2 per cent glucose peptone media produces approximately constant amounts of acid and no appreciable amount of ammonia. Proteolytic fermentation in 2 per cent peptone results in the formation of acid and ammonia, the amounts of both increasing as the initial reaction of the medium is varied in the direction of increased alkalinity.

Indol formation is retarded by the presence of free acid or of free alkali in the medium. Certain sugars, when present, inhibit the activity of the proteolytic enzymes and thus inhibit the formation of indol. The inhibiting power by carbohydrates varies somewhat; 2 per cent glucose inhibits completely; 2 per cent lactose and 2 per cent maltose inhibit almost completely. The inhibition by 2 per cent saccharose and 2 per cent mannite is only partial, and 2 per cent starch possesses no inhibitory power at all.—R. E. B.

519. *Action coagulante du Staphylocoque sur le plasma hirudiné.* (*The Coagulant Action of Staphylococci upon Hirudinized Plasma.*) ANDRÉ GRATIA. Compt. rend. Soc. de biol., Par., 1919, 82, 1393.

Staphylococci induce a coagulation of hirudinized plasma. This action is not brought about through a neutralisation of the hirudin.—G. H. S.

520. *Bacille d'Eberth en chainettes.* (*B. typhosus in Chains.*) A. RANQUE AND CH. SENEZ. Compt. rend. Soc. de biol., Par., 1919, 82, 1421.

Two cases are reported in which organisms which appeared to be Gram-negative streptococci were isolated from the blood. Further examination showed both strains to be *B. typhosus*.—G. H. S.

521. *Sur la culture du microbe bactériophage.* (*Cultivation of a Bacteriophagous Organism.*) F. D'HERELLE. Compt. rend. Soc. de biol., Par., 1920, 83, 52.

The bacteriophagous organisms attack and cause lysis of living bacteria only; they have no activity against dead microorganisms. Thus, if a culture containing only living bacteria is inoculated with the bacteriophagous material all of the organisms are lysed and the medium becomes perfectly clear. If dead bacteria are present the medium clears only to the extent of the lysis of the living bacteria. If cultures of bacteria are inoculated with filtrates containing a sufficient number of the bacteriophages, lysis occurs promptly. If the bacteriophages are present in small number, insufficient to bring about immediate lysis, the medium gradually becomes turbid through the growth of the bacteria during a period of six hours and then a gradual and complete clearing takes place as the bacteriophagous organisms gain the ascendancy.—G. H. S.

522. *Sur la résistance des bactéries à l'action du microbe bactériophage.* (*The Resistance of Bacteria to the Action of the Bacteriophagous Organism.*) F. D'HERELLE. Compt. rend. Soc. de biol., Par., 1920, 83, 97.

When the bacteriophagous organism is of sufficient virulence all of the bacteria with which they come in contact are killed. The bacteriophage invades the bacterial cell, secretes dissolving diastases and the bacterium disintegrates. A generation of bacteriophagous organisms are thus set free in the medium and they are then able to penetrate other bacteria, and continue the process until all of the bacteria are destroyed. With bacteriophagous organisms of less virulence some of the bacteria escape penetration and lysis, and their descendants, developing in contact with the bacteriophages, acquire an increased resistance which persists as long as they remain in the medium in which they have been growing. The increased resistance is not permanent, since subcultures from these strains are susceptible to the action of the bacteriophages.—G. H. S.

523. *Ein veränderlicher, Milchsucker spaltender Paratyphusbazillus.* (*A Mutable Paratyphoid Bacillus Fermenting Lactose.*) WALDEMAR LOEWENTHAL. Centralbl. f. Bakteriol. (etc.), Jena. I. Abt., Orig., 1919, 83, 227-321.

A description of a culture of a paratyphoid organism secured from a stool. The original culture was subdivided into a gas forming and a non-gas producing type. Variations were also found in the ability of the subcultures to produce acid. The organism is characterized as one which shows marked fluctuation in acid producing and gas producing power.—R. E. B.

524. *Hefeextraktnährböden.* (*Yeast Extract Culture Media.*) A. KRESSLER. Centralbl. f. Bakteriol. (etc.), Jena. I. Abt., Orig., 1918, 80, 380-383.

Brief discussion of yeast extract as a suitable substitute for beef extract in culture media.—M. L.

525. *Asparagin als Stickstoffquelle für Typhus bakterien.* (*Asparagin as a Source of Nitrogen for Typhoid Bacilli.*) G. GASSNER. Centralbl. f. Bakteriol. (etc.), Jena. I. Abt., Orig., 1918, 80, 258-264.

Asparagin may be used as a source of N not only by *B. coli*, but by *B. typhosus*, *B. paratyphosus* A and B and the dysentery strains. There is a quantitative difference in the availability of asparagin for these strains.—M. L.

## PHYSICAL CHEMISTRY

526. *The Determination of Hydrogen Ion Concentration.* JOHN W. M. BUNKER. J. Biol. Chem., Balt., 1920, 41, 11-14.

The description with diagram of an hydrogen electrode is given. The apparatus is designed to meet the requirements of quick, accurate determinations in large numbers, particularly in bacteriological work.—R. E. B.

527. *Influence of Hydrogen Ion Concentration upon the Volatility of Indole from Aqueous Solutions.* HARPER S. ZOLLER. J. Biol. Chem., Balt., 1920, 41, 35-44.

The most rapid volatilization of indol from solutions occurs between the values of pH 8 to pH 10.5. Hydrogen ion concentrations greater than  $10^{-4}$  gave a decrease in the volatility of indol with water vapor, probably owing to the formation of weakly associated combinations between indol and acid in aqueous solutions. The direct method of distillation rather than steam distillation has been found to be reliable and commendable in routine investigations in the laboratory.—R. E. B.

528. *Ueber experimentelle und praktische Versuche zum Typhusbazillennachweis mittels Adsorbentien. (Experimental and Practical Studies on the Recognition of Typhoid Bacilli by Means of Adsorbents.)* FRITZ VON GUTFELD. Centralbl. f. Bakteriöl. (etc.), Jena. I. Abt. Orig., 1919, 83, 102-108.

Michaelis has suggested that a preparation of kaolin may be used as an adsorption material for the differential adsorption of coli and typhoid bacilli. The kaolin is washed with diluted hydrochloric acid and carefully washed with distilled water until neutral. The washed kaolin is added to suspensions of typhoid and coli bacteria in mixture; filtered after a short time through filter paper, and the filtrate used for inoculating Drigalski plates. It was found by Michaelis that the colon bacilli were in general adsorbed and the typhoid bacilli passed through. Gutfeld, as a result of tests of pure cultures and mixtures of cultures as well as practical tests on typhoid stools, reaches the conclusion that there is no noteworthy difference in the action of the various materials used, such as kaolin, boluphen, and sea-sand. The adsorbent materials do not act uniformly at different times on the same species of organism. From mixtures, sometimes one, sometimes the other, and sometimes both species will be adsorbed. The use of the adsorbents shows no particular advantage over the modern method of isolation. It is not possible to detect any elective action on the part of kaolin and other preparations.—R. E. B.

529. *The Use of the Colorimeter in the Indicator Method of H-ion Determination with Biological Fluids.* B. M. DUGGAR AND C. W. DODGE. Ann. Missouri Bot. Garden, St. Louis, 1919, 6, 61-70.

The authors describe a double cup attachment to the Kober nephelometer-colorimeter whereby: "(1) the difficulties involved in the approximate determination of the hydrogen-ion concentration of solutions exhibiting color may be largely overcome; and (2) the useful range of certain brilliant indicators may be so considerably extended that the number of indicators employed may be materially reduced."—P. L. G.

530. *Precipitation-Structures Simulating Organic Growth. II.* RALPH S. LILLIE AND EARL N. JOHNSTON. Biol. Bull., Bost., 1919, 36, 225-272.

A study of precipitation-structures formed with iron, zinc, cadmium, cobalt, nickel, copper, lead, strontium, chromium, and aluminium with  $K_2FeC_2O_4$ . For each metal which forms a precipitate with this compound a definite and characteristic type of precipitation-structure is developed. The presence or absence of a protective colloid has a marked influence on the kind of structure formed. A study was made of the conditions which modify the structures developed. Particular attention is called to the rhythmic motion observed during the formation of groups of small structures on the surface of nickel and other metals, also to the periodicity as exhibited by these structures. A number of excellent photomicrographs of the precipitation-structures simulating organic forms are given.—R. E. B.

531. *Influence of the Concentration of Electrolytes on the Electrification and the Rate of Diffusion of Water Through Collodion Membranes.* JACQUES LOEB. J. Gen. Physiol., Balt., 1919, 2, 173-200.

Solutions of non-electrolytes, such as sugars, influenced the initial rate of diffusion of water through the membrane approximately in direct proportion to their concentrations. This became manifest with concentrations of sugar above M/64 or M/32. The author terms this the gas pressure effect. This gas pressure effect upon the initial rate of diffusion is also shown by solutions of electrolytes, but is usually manifest at a somewhat higher concentration, usually at about M/16. "Solutions of electrolytes of a lower concentration than M/16 or M/8 have a specific influence on the initial rate of diffusion of water through a collodion membrane from pure solvent into solution which is not found in the case of the solutions of non-electrolytes and which is due to the fact that the particles of water diffuse in this case through the membrane in an electrified condition, the sign of the charge depending upon the nature of the electrolyte in solution, according to two rules given in a preceding paper." The curves

which represent the influence of the concentration of the electrolyte on the rate of diffusion of water into the solution rise rapidly with increase in concentration to a maximum usually of about  $M/256$ . Increase in concentration beyond this point causes a drop in the curve, and the fall continues until the gas pressure effect is manifest. "Within a range of concentrations between  $M/256$  and  $M/16$  or more (according to the nature of the electrolyte) we notice the reverse of what we should expect on the basis of van't Hoff's law; namely, that the attraction of a solution of an electrolyte for water diminishes with an increase in concentration."

"In the lowest concentrations attraction of the electrified water particles by the ions with the opposite charge prevails over the repulsion of the electrified water particles by the ions with the same sign of charge as that of the water; while beyond a certain critical concentration the repelling action of the ion with the same sign of charge as that of the water particles upon the latter increases more rapidly with increasing concentration of the solute than the attractive action of the ion with the opposite charge."—R. E. B.

552. *Studies on Coagulation. I. On the Velocity of Gelation and Hydrolysis of Gelatin Sol.* RINNOFUKE SHOJI. *Bio-Chem. J., Liverpool*, 1919, 13, 227-238.

An equation is developed which represents the changes in viscosity in the early stages of gelation. The bearing of this equation upon the nature of gelation is discussed at length. Another equation is developed which represents the change in viscosity of a gelatin sol with respect to time in the course of its hydrolysis, caused by heating.—R. E. B.

553. *The Combination of Enzyme and Substrate. I. A Method for the Quantitative Determination of Pepsin. II. The Effect of the Hydrogen Ion Concentration.* JOHN H. NORTHRUP. *J. Gen. Physiol., Balt.*, 1919, 2, 113-122.

The author gives a quantitative method for the determination of pepsin, the method being based upon determination of the changes in conductivity of digesting egg albumin solutions. It was possible to follow by this method the combination of the pepsin with an insoluble substrate. "The amount of pepsin removed from solution by a given weight of substrate is independent of the size of the particles of the substrate. There is an optimum zone of hydrogen ion concentration for the combination of enzyme and substrate corresponding to the optimum for digestion. It is suggested that the pepsin combines largely or entirely with the ionized protein."—R. E. B.

554. *The Isoelectric Points of the Proteins in Certain Vegetable Juices.* EDWIN J. COHN, JOSEPH GROSS AND OMER C. JOHNSON. *J. Gen. Physiol., Balt.*, 1919, 2, 145-160.

Information regarding the proteins in vegetables and meats is of importance in determining methods of dehydration and the preparation of satisfactory dehydrated products. Three vegetables, potatoes, carrots and tomatoes, were studied. Filtered potato juice was found to be practically neutral and contained the globulin, tuberin, to the extent of from 1 to 2 per cent. The isoelectric point of tuberin coincided with a slightly lower hydrogen ion concentration than  $10^{-4}$  N. It was not completely precipitated at its isoelectric point although least soluble at that point. "The isoelectric point of the protein in carrot juice coincided with that of tuberin. Remarkably similar also were the properties of carrot juice and the juice of the potato. The protein of the tomato existed in a precipitated form near its isoelectric point. Accordingly it was not present to any extent in filtered tomato juice. If, however, the considerable acidity at which the tomato exists was neutralized the protein dissolved and was filterable. The addition of sufficient acid to make the hydrogen ion concentration slightly greater than  $10^{-4}$  N again precipitated the protein at its isoelectric point."—R. E. B.

## BACTERIOLOGICAL TECHNIC

(See also Number 877)

555. *Relative Value of Cultural and Inoculation Tests for Detection of B. tetani.* IDA A. BENGTSON AND G. W. MCCOY. *Am. J. Pub. Health, Concord*, 1919, 9, 427-430.

The authors present the results of a series of experiments designed to test the relative efficiency of the direct guinea pig inoculation ("safety test") and the cultural tests for the detection of the tetanus organism in vaccine virus. From one set of experiments it appeared that the cultural test (in plain broth fermentation tubes) followed by guinea pig inoculation will detect 1/100 the number of tetanus spores that are shown by direct animal inoculation (guinea pigs or mice) without preliminary cultivation. In another set of experiments, by the direct animal inoculation, tetanus was detected in but 3 of 35 samples of vaccine virus seeded with tetanus spores. Preliminary cultivation followed by inoculation into mice invariably gave positive results.—I. S. F.

556. *The Isolation of the Single Bacterial Cell.* N. Mutch. *J. Roy. Micr. Soc. Lond.*, 1919, 248, 221.

The author describes a simple and easy method for separating a single organism from its fellows in a small quantity of medium.

- Apparatus required: (1) Microscope with  $\frac{1}{2}$  inch and  $\frac{1}{4}$  inch lenses; (2) Artificial light; (3) Hanging drop slides, prepared by cementing tin alloy rings  $\frac{1}{2}$  inch diameter upon ordinary 3 by 1 glass slides with vaseline or Canada balsam; (4) Square cover glasses, No. 1 thickness, clean and stored in absolute alcohol; (5) Platinum loop very small; (6) Filter paper; (7) Cork borers  $\frac{1}{2}$  inch and  $\frac{1}{4}$  inch diameter respectively; (8) Normal saline solution sterile; (9) Tube of liquid nutrient agar, cooled to 42°C.

#### Method

Six to eight hour old cultures of the desired organism are suspended in sterile broth or normal saline.

Paper rings moistened with saline are placed in the hanging drop cells.

A minute drop, not greater than 0.5 mm. to 0.75 mm., of the suspension is placed in the center of the cover slip. This slip is then inverted in position over the moist chamber. The author emphasizes the fact that the slip must be inverted quickly or the drop will dry. Once in position the drop remains unchanged for a long time. By means of the  $\frac{1}{2}$  inch objective and  $\frac{1}{4}$  inch oil immersion, the drop is examined. In this way series of drops are prepared until a drop containing a solitary organism is found. The cover-slip of this preparation is then raised and a large drop of liquid agar or other suitable medium added. The preparation is placed in a moist cell, incubated for 24 hours and examined under the microscope. If the original observation is correct only one colony will develop.

The author claims that this method requires only simple apparatus and is easily carried out.—E. B. F.

537. *The So-Called Reduced Oxygen Tension for Growing the Meningococcus.* EDWARD F. KOHMAN. J. Bact., Balt., 1919, 4, 571-584.

This paper presents in essence results which are in agreement with those announced by Gates (J. Exper. M., N. Y., 1919, 29, 325) which appeared after the writing of this paper. The beneficial effects of the so-called reduced oxygen tension in the cultivation of the meningococcus are largely or chiefly attributable to the presence of the CO<sub>2</sub> which is used to replace a portion of the air in the cultivation receptacle. The CO<sub>2</sub> going into solution in the medium reacts with the alkalies in reserve and tends to establish an equilibrium between hydrogen and hydroxyl ions (H<sub>2</sub>CO<sub>3</sub> : NaHCO<sub>3</sub>) at a point which gives the optimum pH for the meningococcus. With a medium of a pH+ of 7.8-8.0 and incubation in an atmosphere in which 10 per cent of the air has been replaced by CO<sub>2</sub>, pneumococci and streptococci besides meningococci may be grown equally well.—I. S. F.

538. *Zur Technik des Gonokokkennachweises. (Technic for Demonstrating Gonococci.)* E. KINDBORG. Centralbl. f. Bakteriol. (etc.), Jena. I. Abt., Orig., 1917, 80, 188-190.

A new differential stain for gonococci—carbolthionin-picric acid—is described. The gonococci stain dark brown, other bacteria deep red.—M. L.

539. *On Methods of Isolation and Identification of the Members of the Colon-Typhoid Group of Bacteria. Study of Bactericidal Action of CR Indicator.* J. BRONFENBRENNER, M. J. SCHLESINGER AND D. SOLETSKY. J. Bact., Balt., 1920, 5, 79-87.

"The bactericidal power of CR (China blue—rosolic acid) is due entirely to the action of rosolic acid. Moreover, the inhibition of growth seems to be directed only against Gram-positive bacteria. Almost all Gram-negative bacteria tested grow readily on a medium containing twenty-five times the amount of rosolic acid which is inhibitive for Gram-positive organisms. This apparent selective action of rosolic acid, coupled with its failure to inhibit the growth of *B. dysenteriae* renders this dye particularly suitable for the preparation of selective media to be used for the isolation of intestinal bacteria."—I. S. F.

540. *Extracts of Pure Dry Yeast for Culture Media.* S. HENRY AYERS. J. Bact., Balt., 1920, 5, 89-98.

Yeast extracts from dry fresh yeast makes a good medium for the growth of many bacteria, especially when used with peptone. Autolysed yeast, containing relatively more of amino acids and other nitrogenous substances makes a more valuable medium—especially with peptone. This medium proved to be of great value in studying the fermentation reactions of delicate streptococci. Acid and pepsin digests of dry yeast make valuable ingredients in media for delicate organisms.—I. S. F.

541. *A Culture Medium for the Maintenance of Stock Cultures of Bacteria.* M. COBB WORTH. J. Bact., Balt., 1919, 4, 603-608.

The use of a medium is suggested upon which stock cultures may be kept for longer than the usual periods without transfer and without the undesirable effects usually ensuing from neglect to transfer cultures at relatively short intervals. The following medium has been found satisfactory for the preservation of *B. typhosus*, *B. paratyphosus*, *B. coli*, *B. dysenteriae*, *B. pertussis*, *Micrococcus catarrhalis*, a streptococcus, the meningococcus and gonococcus for several months without transfer:

## Nutrient Gelatin:

Chopped beef.....	500 grams
Water.....	1000 cc.
Heated in water bath 50-55°C. for 1 hour; strained through bag cloth, volume restored:	
Peptone.....	10 grams
NaCl.....	5 grams
Gelatin.....	100 grams

Dissolved, filtered, adjusted to 1 per cent acid; sterilized for 20 minutes at 110°C.

The meningococcus and gonococcus cultures are kept at 37°C.; others are kept at 20°C.

—I. S. F.

542. *A Modified Procedure for the Preparation of Testicular Infusion Agar.* GUY W. CLARK. *J. Bact.*, Balt., 1920, 5, 99-101.

Description of an improved technic.—I. S. F.

543. *Die Wiedergewinnung von gebrauchten gefärbten Agarnährböden auf kaltem Wege ohne Filtration.* (The Recovery of Used Colored Agar Media by a Cold Process Without Filtration.) H. ZIPFEL. *Centralbl. f. Bakteriologie* (etc.), Jena. I. Abt., Orig., 1918, 80, 472-480.

Methods are described for the reutilization of used Endo, Drigalski-Conradi, and Malachite Green media.—M. L.

544. *Ueber die Regenerierung von Nährböden.* (Recovery of Culture Media.) EDMUND STRÖSSNER. *Centralbl. f. Bakteriologie* (etc.), Jena. I. Abt., Orig., 1917, 80, 223-225.

Describes a method successfully employed to recover and reutilize Endo and Conradi-Drigalski agar.—M. L.

545. *Ein neuer Dreifarben-nährboden zur Typhus-Ruhr-Diagnose.* (A New Three Color Medium for Typhoid-Dysentery Diagnosis.) G. GASSNER. *Centralbl. f. Bakteriologie* (etc.), Jena. I. Abt., Orig., 1917, 80, 219-222.

By the use of a mixture of water-blue and metachrome yellow in lactose agar, a greenish medium is obtained on which *B. coli* produces distinct blue, and *B. typhosus* and *B. dysenteriae* yellowish colonies.

The medium is prepared by adding the following to 2 liters yeast water agar or nutrient agar which should be slightly alkaline to litmus:

- (1) 126 cc. of 2 per cent metachrome yellow (boiled 2 minutes).
- (2) 175 cc. of 1 per cent water blue + 100 g. lactose (boiled for 10 min.).—M. L.

546. *Zur Herstellung von Bakteriennährböden mittels Dr. Eichloffs "Extrakt aus Magermilch."* (On the Preparation of Bacterial Nutrient Media by Means of Dr. Eichloff's "Extract From Skim Milk.") W. PFELDER. *Centralbl. f. Bakteriologie* (etc.), Jena. I. Abt., Orig., 1919, 83, 298-299.

A discussion of the substitution of this extract for Liebig's and other meat extracts, during the war.—R. E. B.

547. *Eine Bemerkung zum Kindborgschen Säurefuchsinagar.* (A Note on Kindborg's Acid Fuchsin Agar.) GUSTAV GASSNER. *Centralbl. f. Bakteriologie* (etc.), Jena. I. Abt., Orig., 1919, 83, 301-304.

A discussion of the differentiation of microorganisms belonging to the colon typhoid series by means of an acid fuchsin medium.—R. E. B.

548. *The Preparation of Silica Jelly for Use as a Bacteriological Medium.* ALBERT TOM LEGG. *Bio-Chem. J.*, Liverp., 1919, 13, 107-110.

Detailed methods are given for the preparation of a suitable dialyzing membrane for the preparation of silicic acid and silica jelly. The membrane should have a standard permeability. One which is rather thick and has low permeability is best. Sufficient time should be allowed for the sodium silicate and hydrochloric acid to react completely after mixing before dialysis. Distilled water only should be used in dialyzing. The medium should be tubed as quickly as possible after removal from the membrane and autoclaved immediately.—R. E. B.

549. *Quantitative Estimation of Indole in Biological Media.* HARPER S. ZOLLER. *J. Biol. Chem.*, Balt., 1920, 41, 25-36.

The author's summary is as follows: "The limitations of the nitroso-indole reaction of Baeyer have been studied with the idea of improving and standardizing the Nonnotte and Demanche application of it to the quantitative determination of indole. The method evolved is simple, reliable and rapid, and requires only the reagents and apparatus common to most laboratories. The indole is separated from the parent mass by one direct distillation. Use of the nitroso reaction, when accompanied by an alcohol solvent, for testing the distillate from biological media for the presence of indole is advocated. A warning is sounded against the use of the vanillin acid test for indole."—R. E. B.

550. *Paraffinum liquidum zur Erhaltung von Dieudonné's Blut-Alkali-Mischung. (Liquid Paraffine as a Preservative of Dieudonné's Alkaline Blood Medium.)* J. J. VAN LOGHEM. Centralbl. f. Bakteriöl. (etc.), Jena. I. Abt., Orig., 1918, 80, 383-384.  
The medium may be preserved by covering with a layer of liquid paraffin.—M. L.

551. *Sulla colorazione dei bacilli tubercolari col lacto-bleu di metilene alcoolico. (The Staining of Tubercle Bacilli with Lacto-Methylene Blue.)* A. GASBARRINI. Policlin., Roma, 1919, 26, 874.

A method for staining *B. tuberculosis* which offers economy of time, and differentiation between Koch's bacillus and other acid-fast bacilli. It is well known that mineral acids often decolorize even *B. tuberculosis*. Organic acids are successful not only because a larger number of tubercle bacilli are rendered visible, but also because they are differentiated from the paratubercle bacilli. Lactic acid is therefore recommended; to be used in the following manner: After staining with Ziehl's carbol-fuchsin, place the slide in a solution of lacto-methylene blue for 2 to 3 minutes. Wash in tap water, dry and examine.

The lacto-methylene blue is made as follows:

Alcohol, 95 per cent.....	4 parts	} .....	40 cc.
Lactic acid.....	1 part		
Distilled water containing methylene blue in excess .....			160 cc.

—P. M.

552. *Barron's Polychrome Toluidin Blue as a Substitute for Methylene Blue in the Eosin-Methylene Blue Method of Mallory.* R. C. WHITMAN. J. Lab. Clin. M., St. Louis, 1920, 5, 329.

The author describes the preparation of the toluidin blue solution, the staining method and the advantages of the substitution.—F. W. H.

553. *Procédé simple de neutralization de l'eau distillée destinée aux colorations dérivées de la méthode de Romanowsky. (A Simple Method of Neutralizing the Distilled Water for Romanowsky Staining.)* A. PONSSELLE. Compt. rend. Soc. de biol., Par., 1919, 82, 1328.

Attention is called to the fact that distilled water is usually acid, and that for successful staining by the methods of Romanowsky, Laveran, Giemsa, Pappenheim, Tribondeau, etc., the water should be neutral. The use of brom-cresol purple is advocated for adjustment of the water to neutrality, using n/100 sodium carbonate. The water containing the dye is used in preparing the stains.—G. H. S.

554. *Observations on the Accuracy of Different Methods of Measuring Small Volumes of Fluid.* FREDERICK WILLIAM ANDREWES. Bio-Chem. J., Liverp., 1919, 13, 37-44.

Volumes of 1 cc. and 0.5 cc. can be measured by a pipette with reasonable accuracy. "The error attendant on the attempt to deliver 0.1 cc. may amount to 5 per cent even when a 0.1 cc. pipette is employed. The delivery of 0.01 cc. from a pipette may be exceedingly inaccurate. The only way in which really accurate results can be obtained with a pipette in preparing an ascending series of dilutions is to use it as a delivery pipette and to wash and dry it between successive measurements. The alternative method, that of using it as delivery, pipette, mixing the dilution by shaking and then washing out two or three times with the mixture and rejecting the washing, is one hardly adapted for serological work. Unless such precautions are taken the small error introduced, perhaps only 1.5 per cent in a single measurement, becomes magnified to 1 to 10 per cent in each dilution. The drop method is greatly to be preferred for serological work to the pipette method providing it is properly carried out."—R. E. B.

555. *Eine Pipette für bakteriologisches und serologisches Arbeiten. (A Pipette for Bacteriological and Serological Work.)* M. NEISSER AND H. BRAUN. Centralbl. f. Bakteriöl. (etc.), Jena. I. Abt., Orig., 1919, 83, 299-301.

A description of a pipette with special equipment especially fitted for serological work and accurate measurement.—R. E. B.

556. *An All-Glass Nitrogen Apparatus.* E. R. ALLEN AND B. S. DAVISSON. Ann. Missouri Bot. Garden, St. Louis, 1919, 6, 45-47.

A distillation apparatus constructed by Pyrex glass is described in which all rubber connections are eliminated.—P. L. G.

557. *Zur Verhütung von Laboratoriumsinfektionen. (The Prevention of Laboratory Infections.)* FERDINAND REINHARDT. Centralbl. f. Bakteriöl. (etc.), Jena. I. Abt., Orig., 1918, 80, 456-465.

A syringe which is operated with the forefinger is attached to the pipette. This eliminates mouth suction.—M. L.

## FERMENTATION INDUSTRIES

(See also Number 876)

558. *Acid Fermentation of Xylose.* E. B. FRED, W. H. PETERSON AND AUDREY DAVENPORT. J. Biol. Chem., Balt., 1919, **39**, 347-384.

Bacteria which are capable of fermenting xylose were found abundantly in fresh silage, in sauer kraut, in manure and in a few soils. The ordinary bacteria of the laboratory studied completely failed to bring about fermentation in xylose. Among the organisms tested were various yeasts and many of the bacteria commonly cultivated in the laboratory. Xylose fermenters are readily isolated by plating on a xylose yeast agar. The bacteria fermenting xylose are rod-shaped organisms with blunt ends, non-spore producing, Gram-positive, producing punctiform colonies on agar. Media containing cabbage extract or yeast extract are preferable to media beef extract or peptone. Acid is produced from sucrose, glucose, lactose, levulose, mannitol and xylose in yeast water. No gas is produced in the closed arm of a fermentation tube although very small amounts of carbon dioxide, but not enough to show gas bubbles, are developed. The optimum temperature is between 30 and 35°C. The bacteria are facultative anaerobes. The name *Lactobacillus pentoaceticus* is given.

Acetic and lactic acids are produced in the fermentation of xylose. The lactic acid formed is racemic. About 90 per cent of the sugar is converted into acid. The ratio of acetic to lactic acid is found to be approximately 43:57 which approaches fairly well the theoretical ratio 40:60 which would be obtained if these two compounds were the only ones produced from the cleavage of the xylose molecule.

More than half of the acids are produced from the first to the fourth day. The ratio of the volatile to non-volatile acid is approximately uniform throughout the entire period of fermentation. The maximum amount of acid per gram of xylose fermented was secured from solutions containing from 2 to 3 per cent of the sugar. Fructose is fermented rapidly with the production of acids and of mannitol. It is suggested that these organisms may be of considerable importance and significance in the production of acids in silage.—R. E. B.

559. *Studies on Proteinogenous Amines. IV. The Production of Histamine from Histidine by Bacillus coli communis.* KARL K. KOESSLER AND BURTON T. HENKE. J. Biol. Chem., Balt., 1919, **39**, 539-584.

Histidine when used as the sole source of carbon for the colon bacillus, either with or without nitrates or ammonium salts, is not converted into histamine. In the absence of nitrates or ammonium salts and in the presence of glycerol no histamine is formed from histidine, but apparently imidazole-propionic acid is developed when the organism grows under anaerobic conditions.

With a carbon source such as glycerol or glucose, and a nitrogen source such KNO<sub>3</sub> or NH<sub>4</sub>Cl or both, about 50 per cent of the histidine is converted into histamine in two weeks under aerobic conditions. Under anaerobic conditions all the metabolic activities of the organism are materially reduced.

Production of histamine is always coincident with the production of a medium which is distinctly acid. "We believe that the histamine is formed by the bacillus to neutralize the excess of acidity simultaneously produced from the glycerol. Histamine is never formed except in the presence of an easily available source of carbon, such as glycerol or glucose, on the contrary to the statement frequently found in literature."—R. E. B.

560. *Vitamine Requirements of Certain Yeasts.* FRED A. MACHMANN. J. Biol. Chem., Balt., 1919, **39**, 235-258.

The species of yeast studied by the author vary in their needs for traces of organic matter other than the sugar in the medium. "All the yeasts which I have used grow better and ferment more readily in a medium containing some small amounts of organic material. I have also found that some yeasts will grow in and ferment a solution of inorganic salts and sugar even when they are introduced in small amounts. In these points my observations agree with those of Pasteur." A yeast isolated from fermenting canned pears was found which would not grow in or ferment a solution of inorganic salts and sugar unless introduced in very large amounts, and even then the fermentation was not vigorous. It was found that substances which, by other experimenters, have been found to be rich in vitamins, especially water soluble A, make it possible for this yeast to bring about fermentation. It is suggested that such yeasts might be used to determine the presence of certain vitamins, and possibly to determine quantitatively the amount of vitamins present in various substances. In general the observations are a confirmation of the work of Wildier, who gave the special name "bios" to the substance which he thought lacking in inorganic culture media. While some yeasts appear to be able to cause fermentation of a medium which contains little or no vitamin, the pear yeast isolated does not have this power nor is it capable of synthesizing its own vitamins.—R. E. B.

561. *Yeast Growth and Alcoholic Fermentation by Living Yeasts.* A. SLATOR. J. Soc. Chem. Indust., Lond., 1919, **38**, 391-392.

The process of alcoholic fermentation by yeasts may be studied by the methods used by the physical chemists to measure chemical reactions. The author describes the growth of



yeast cells in a nutrient medium and points out the main factors which determine the rate of growth and rate of fermentation at different stages of the reaction. A diagram shows the five different phases of growth: (1) Lag phase in growth; (2) logarithmic phase; (3) retarded phase; (4) yeast crop; (5) death of yeast cells. After the initial disturbance (lag-phase) the cells multiply regularly, the number increasing logarithmically with the time. The usual equation for a unimolecular chemical reaction may be applied to this phase provided it is noted that the reaction is increasing in rate instead of decreasing. If all necessary food is present the yeast cells develop at a rate determined by the temperature and the race of the yeast. At 25°C. the rate is usually four times that at 15°C. About one hour was found to be the shortest generation time. The author does not agree with the equation of Ledingham and Penfold for the lag-phase in the growth of bacteria.

In the retarded growth phase, the yeasts are first influenced by CO<sub>2</sub>, and later by lack of oxygen. Although alcohol acts as a retarding agent, growth usually stops before the alcohol is sufficient to have much influence. The final cessation of yeast growth is usually lack of oxygen.

The author gives formulae for calculating the rate of growth and fermentation at different periods.—E. B. F.

562. *Yeasts and Bread Making*. Editorial. Sci. & Indust., Australia, 1919, 1, 265-266.

The Director of Technical Education of New South Wales reports the preparation of yeasts, 3 ounces of which moist will ripen 400 pounds of dough in 5 hours. A continuous demonstration has been carried out since 1916, at the School of Bakery, Sydney Technical College, of the practicability of preparing bread in 9 hours, i.e., from starting to mix the dough until the bread leaves the oven. A single stock of yeast has been used for 19 months for the preparation of bread, making each day's yeast with a portion of the previous brew, thus demonstrating the practicability of this method. The conditions under which these results have been achieved have been studied in detail and precise information has been obtained in regard to the constituents of the wort, aeration and temperature.

Two points are now being investigated; first, why a particular concentration of the sugar present in the yeast liquor is needed, if the yeast is to work rapidly when used in small quantities, and how to preserve the yeast in a potent form for a longer period; it keeps only a few days without deterioration.—Z. N. W.

563. *Glyceringewinnung durch Gärung*. (Production of Glycerin in Fermentation.) *BODM. Ztschr. f. Spiritusindust.*, 1919, 42, 140-141.

A review of the progress made in Germany in the manufacture of glycerin through alcoholic fermentation. The advantage of using sodium sulphite and an alkaline solution was pointed out. With an increase of sulphite there is an increase in the amount of glycerin to a maximum of 27.1 per cent, a decrease in the production of alcohol from 40 per cent to 23.3 per cent, an increase in aldehyde from 2.4 per cent to 8.6 per cent and a decrease in carbon dioxide from 37.6 per cent to 29.4 per cent.—R. E. B.

564. *Glyceringewinnung durch Gärung*. (Glycerin Production by Fermentation.) *BODM. Wehnschr. f. Brauerei*, 1919, 42, 13.

The addition of alkali in amounts not damaging to the yeasts increased materially the amount of glycerin formed in alcoholic fermentation. Sodium sulphite exerts a particularly favorable influence. On the other hand, the kind of yeast, the character of the sugar and the fermentation temperature do not have an appreciable effect on the formation of glycerin. In some tests as much as 15 per cent of glycerin was produced in fermenting fluids in which yeast had access only to sugar and mineral salts. On a large scale, one may secure from 100 parts of sugar; 20 parts of glycerin, 27 parts of alcohol and 3 parts of aldehyde. The yeasts remain active in spite of some slight morphological changes and in spite of the high concentration of salt and the strong alkaline reaction of the nutrient solution. They may be used for inoculation of succeeding vats. The appearance of aldehyde in addition to alcohol is characteristic. The amounts of aldehyde and glycerin increase with the addition of the sulphites while the amounts of alcohol and carbon dioxide decrease.—R. E. B.

565. *Ueber den Einfluss der Temperatur auf verschiedene Funktionen der Hefe*. (Influence of Temperature on the Various Functions of Yeast.) H. ZIKES. *Allg. Ztschr. f. Bierbrauerei u. Malsfabrikation*, 1919, 47, 45.

Report of the study of the influence of temperature on the vegetative growth, budding, time of generation, spore formation, film formation, fat formation, glycogen formation, fermentation, acid increase, cell content, pigment formation, and rate of death of yeast.—R. E. B.

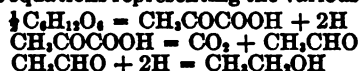
566. *Die Maltase. Ihre Durchlässigkeit durch die Zellwand und ihre Abhängigkeit von der Züchtung in leichten oder schweren Bieren*. (Maltase. Its Penetrability Through the Cell Wall, and Its Dependence on Growth in Light or Heavy Beers.) F. SCHÖNFELD, H. KRUMHABER AND M. KORN. *Wehnschr. f. Brauerei*, 1918, 35, 181.

Invertase is the only one of the carbohydrate enzymes which can pass through the wall of a yeast cell. In order to release maltase it is necessary to rupture the cell or that it shall be killed, when the cell sap may be forced out by the use of high pressure. The author used

Fischer's method of yeast killed with toluol. Eight volumes per cent of toluol to 2 per cent suspension of yeast was employed. The ability of the clear filtrate, free from yeast cells, to split maltose is then determined. It was found that the maltase could not diffuse from bottom yeasts but that it did diffuse from top yeasts.—R. E. B.

587. *Der heutige Stand des Gärungsproblems. (The Present Status of the Fermentation Problem.)* F. BOAS. *Ztschr. f. d. ges. Brauwesen*, Munich, 1919, 42, 87-88.

The author summarises the results of recent investigators in the field of alcoholic fermentation. The illustrative equations representing the various transformations are as follows:



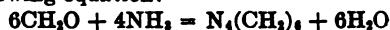
The keto acid is an oxidation product. The acetaldehyde is reduced to ethyl alcohol.—R. E. B.

588. *Die Wasserstoffionenkonzentration im Biere und bei dessen Bereitung. (Hydrogen Ion Concentration in Beer and in its Preparation.)* FRITZ EMSLANDER. *Ztschr. f. d. ges. Brauwesen*, Munich, 1919, 42, 127-130; 135-137.

In fermentation which proceeds to a characteristic transformation of sugar and formation of acid there is developed a definite hydrogen ion concentration. By the development of this hydrogen ion concentration the enzyme automatically produces for itself that surface tension of the substrate which is advantageous to the best diffusion. The formation of such an hydrogen ion concentration is the regulator for the optimum of the enzymic process.—R. E. B.

589. *Formaldehyd und Fermente. (Formaldehyde and Ferments.)* TH. BOKOMY. *Allg. Brauer u. Hopfenzg.*, 1919, 59, 177-187.

Formaldehyde has two-fold action upon ferments; as a poison and as a stimulant. A union of formaldehyde with enzymes is discussed. It is pointed out that the addition of normal ammonia to a solution of formaldehyde leads to the development of hexamethylenetetramin according to the following equation:



The amount of formaldehyde remaining can be estimated by titration with normal sulphuric acid. In this way it is possible to determine the amount of formaldehyde which combines with various preparations of enzymes. The work of Neuberg on aldehydes as accelerators is reviewed.—R. E. B.

570. *Untersuchung über Säurebildung bei Pilzen und Hefen. (Studies on Acid Formation in Fungi and Yeasts.)* F. BOAS. *Ztschr. f. d. ges. Brauwesen*, Munich, 1919, 42, 67-70.

A solution containing 5 per cent carbohydrate, for the most part dextrose, 0.25 per cent of primary phosphate ( $\text{KH}_2\text{PO}_4$ ), 0.1 per cent magnesium sulphate, and 0.5 per cent of various sources of nitrogen, such as peptone, alanin, ammonium chloride, etc., was employed as a medium. Two to three million cells were inoculated into 130 cc. of nutrient solution and incubated in 300 cc. Erlenmeyer flasks. The highest acid value (pH = 2.94) was secured with ammonium chloride as the source of nitrogen. Asparagin gave a maximal acidity of pH 3.20. Urea, alanin and peptone gave pH values varying from 3.54 to 3.67. The smallest amount of acid developed was formed from ammonium tartrate (pH 3.8-4.02). It is evident that there is a definite influence exerted by the source of nitrogen in the presence of the same carbon compounds, on the hydrogen ion concentration in yeast fermentation. After the acid has reached its maximum, there develops relatively quickly a decrease in the hydrogen ion concentration. Various yeast solutions showing pH values of 3.57-3.62 showed variation in amount of tenth normal KOH required for neutralisation of 100 cc., using phenolphthalein as an indicator, from 21.5-36.1 cc. This shows a wide variation of as much as 68 per cent in the amount of acid actually formed in the different media which have retained practically the same pH values.—R. E. B.

## MYCOLOGY

571. *Sur un nouveau champignon présentant des caractères intermédiaires entre les levures et les Endomyces. (A new Fungus Having Characteristics Intermediary Between the Yeasts and the Endomyces.)* A. GUILLIERMOND AND G. PEJU. *Compt. rend. Soc. de biol., Par.*, 1919, 82, 1343.

Description of an organism (*Debaryomyces Klockeri*) isolated from a case of benign angina.—G. H. S.

572. *A Peculiar Entomophthorous Fungus.* E. M. GILBERT. *Tr. Am. Micr. Soc.*, Menasha, 1920, 38, 263-269.

A detailed description of a peculiar fungus found on the fern prothallia grown in water cultures. The organism morphologically resembles the *Empusa* but is of a decided saprophytic nature.—J. H. B.

573. *The Structure of Yeast Nucleic Acid. V. Ammonia Hydrolysis.* P. A. LEVENE. J. Biol. Chem., Balt., 1920, 41, 19-24.

In a mild hydrolysis of yeast nucleic acid with 5 per cent ammonia at a temperature of 100°C. four mononucleotides are produced. Three of these have previously been described. This paper describes the fourth, a crystalline cytidin-phosphoric acid. The danger of mistaken conclusions from analyses of brucine salts is pointed out.—R. E. B.

574. *A Method of Testing the Amylolytic Action of the Diastase of Aspergillus oryzae.* SELMAN A. WAKSMAN. J. Am. Chem. Soc., 1920, 42, 293-299.

A 2 per cent starch paste made from starch grains colored with neutral red is incubated at 40° with varying concentrations of the enzyme to be tested. When the colored starch is liquefied by the action of the enzyme, the change from the colloidal to the clear state is readily observed, if no turbidity is introduced with the enzyme material. Such enzyme concentrations as will liquefy 10 cc. of a 2 per cent starch paste in 1 to 15 minutes give the best results. This end point, when tested with iodine gives a brown to violet color showing that all the starch has been transformed into dextrines. Comparing the starch liquefying powers of malt enzymes and enzymes obtained from *Aspergillus oryzae* the first are found to give a higher Lintner value, while the second give a higher liquefying value. The ratio of the liquefying value to the Lintner value, in the case of the malt preparations, is 1:4 to 1:5, while in the case of *Aspergillus oryzae* enzyme it is 1:1 to 1.5 to 1, so that the liquefying power of the latter, in comparison to its sugar producing power, is 4 to 6 times as great as that of the malt preparations.—H. A. S.

575. *The Action of Radium Emanation on the Vitamines of Yeast.* KANEMATSU FUGIURA AND STANLEY R. BENEDICT. J. Biol. Chem., Balt., 1919, 39, 421-434.

The authors review the work which has been done upon the chemical and physical effect of radium emanation and its effect upon animals, plants (including bacteria) and enzymes. They conclude that inactivation of the growth-promoting factors in yeast occurs, at least partially, as result of exposure to the radium emanation. It is suggested that possibly the therapeutic effect of radium upon cancers may be due, in part at least, to this destruction of growth promoting substance.—R. E. B.

576. *The Function of Vitamines in the Metabolism of Sclerotinia cinerea.* J. J. WILLAMAN. J. Am. Chem. Soc., 1920, 42, 549.

A review of the existing literature on vitamines reveals the probability of their universal occurrence in the organic world. Phenomena of vitamine-like origin have been recorded for mammals, birds, sea plants, fungi, and the bacteria. *Sclerotinia cinerea*, the brown rot fungus of peaches and plums, cannot grow on a medium made up of sucrose, salts, and asparagine. The addition to this medium of small amounts of plant decoctions induces growth. The factor furnished is not one of mineral, nitrogen or energy requirement, but is of the nature of a vitamine. By means of adsorption onto fuller's earth, vitamine preparations were made from a large number of sources. All of these preparations were active in promoting growth in *Sclerotinia*. A few would promote reproduction as well. It is probable that reproduction is simply a different manifestation of the same activities as characterize vegetation. Respiration is the single activity that is apparently most dependent on the vitamine supply. Respiration is common to all the materials which have yielded the vitamine, and the activity of the vitamine prepared from them was proportional to their metabolic or respiratory activity. The evidence points to a close connection between respiration in a cell and its vitamine content. The *Sclerotinia* vitamine is possibly identical with the water-soluble B of the higher animals.—H. A. S.

577. *Die Lebenstätigkeit von Sprossspilzen in mineralischen Nährlösungen. (Viability of Yeasts in Mineral Nutrient Solutions.)* H. NAUMANN. Ztschr. f. techn. Biol., 1919, 7, 1.

The seeding of a single cell of a fermenting, spore forming yeast, in mineral nutrient solution with sugar as a source of carbon, does not lead to any multiplication, especially if a ripened culture is used and soil water is used for dilution. In a seeding of 50 cells or more in 10 cc. of the nutrient solution, multiplication occurs at the cost of the dead cells. The larger the seeding, the more intensive is the multiplication. The addition of nitrogen-free carbon compounds does not stimulate the yeast cells to growth. The addition of yeast extract is a stimulant.—R. E. B.

## SOIL BACTERIOLOGY

578. *Quantitative and Qualitative Bacterial Analysis of Soil Samples Taken in Fall of 1918.* D. H. JONES AND F. G. MURDOCH. Soil Sci., Balt., 1919, 8, 259-267.

A bacterial analysis was made of 46 soils representing 17 soil types obtained in a soil survey of Russell, Carleton, and Stormont counties in Eastern Ontario. Albumen synthetic agar, nutrient gelatin, and modified Ashby's agar were the media employed. *Azotobacter* were found in 9 out of the 17 soil types, the former including all loams except shale loam. On the other hand, no *Azotobacter* were found in the remaining 8 soil types which included the sand, peat-muck and shale soils. Every soil examined, with one exception, had a fairly high

*Ps. radiculicola* content, and in most cases these counts were higher in the sub-surface than in the surface samples. In general, the soils that were favorable for *Azotobacter* had the higher *radiculicola* counts.

The total bacterial and liquefier count was in a general way indicative of soil fertility. *Actinomyces* were least numerous in the sand but averaged up much alike in the loams, peat-muck and shales, in all of which they were fairly numerous. The mold content of the samples was uniform, although it was of interest to note that the yellow sand which gave no *Azotobacter*, no *radiculicola* and the lowest of all total bacterial counts, gave a fairly high mold count, while a sandy clay loam which gave the highest *Azotobacter*, *radiculicola* and total bacteria count, showed no molds.—N. K.

579. (*Studies on Nitrification in Natural Soils and its Importance from an Ecological Point of View.*) H. HESSELMAN. Meddel. Stat. Skogsförsöksanst., 1916-17, No. 13-14, pt. 1, 297-528.

This paper, in addition to a lengthy discussion of the investigation already noted from another source (Abs. Bact. 3, No. 5), embraces a detailed presentation of the experimental results obtained together with a bibliography of 87 titles. (Exper. Sta. Rec. 41, 125.)—H. J. C.

580. *Observations on Soil Protozoa.* D. W. CUTLER. J. Agric. Sci., Cambridge, Eng., 1919, 9, 430-444.

Protozoa were counted by the direct method of Kopeloff, Lint and Coleman, Centbl. Bakt., etc., 1916, Bd. 45, was used. It was rarely found necessary to kill the protozoa, since the motility was insufficient to cause trouble. A magnification of about 600 diameters was used. The dilution method and the direct method of counting, gave similar results.

To suspensions of amebae and flagellate cysts, known weights of different substances, coarse sand, fine sand, and soil were added. These mixtures were agitated for 10 minutes, the solid particles allowed to settle and the number of protozoa per cc. of the supernatant fluid estimated. In all cases a control tube, containing the suspension, but no solid matter, was tested. In no case was there any sedimentation except by absorption of the solid matter. It was found that the particles of sand and soil are capable of withdrawing from the suspension large numbers of protozoa. The smaller the particles, the greater the number of protozoa removed. The author concludes that this power of taking up protozoa is identical, whether the organisms are dead or alive. It is suggested that possibly the protozoa live in the soil atmosphere, which surrounds the soil particle. This atmosphere around the soil particle has an increased percentage of CO<sub>2</sub> and nitrogen. It seems that there may be anaerobic protozoa in the soil. The results show very clearly the tendency of small living organisms to adhere to hard surfaces.—E. B. F.

581. (*The Effect of Regeneration Measures on the Formation of Nitrates in the Soil and its Importance in the Regeneration of Coniferous Forests.*) H. HESSELMAN. Meddel. Stat. Skogsförsöksanst., 1916-17, No. 13-14, pt. 2, 923-1076.

The writer describes investigations having to do with nitrification in forest soils and with the effect upon nitrification of measures usually employed in the care of the forest. Little or no nitrification was observed to occur in the humus covering of mossy coniferous forests, the organic nitrogen not being transformed beyond ammonia. When, however, the humus covering was rather thin and loose, being composed chiefly of mosses and fallen needles, an active transformation into nitrate was observed to occur following felling sufficient to permit a strong access of light. A correlation was noticed between the kind of vegetation and the presence or absence of nitrification. Thorough mixing of the humus with the mineral soil and decaying brushwood and timber and burning over the area resulted in the formation of nitrates even in markedly raw humus. Raw humus soils without nitrification were found to be difficult of regeneration. Experiments indicate that young pine trees develop to better advantage in the presence of nitrification than in its absence, as is also thought to be the case with spruce. In herbaceous spruce forests nitrification was usually observed, and felling resulted in such an increase of nitrates that nitrophilous vegetation became troublesome to the coniferous plants. It was often found necessary to check the growth of this vegetation, the competition of which would otherwise prove fatal to the trees.

A bibliography of 51 titles is appended. (Exp. Sta. Rec., 41, 125.)—H. J. C.

582. (*Partial Sterilization of Soils and the Influence of Soil Protozoa on their Fertility.*) G. TRUFFAUT. Génie Rural, 1919, 22-24.

The theory of partial sterilization of soils is discussed and experiments are summarized that were planned to put partial sterilization of soils on a practical large-scale working basis. Tests conducted on 5-acre plats showed that treatment with carbon bisulphide at the rate of 445 pounds per acre increased crops of cabbage and onions from 170 to 200 per cent; that treatment with aromatic liquids, as benzene, toluene, methylnaphthalin, and anthracenic oils, produced increases of from 125 to 145 per cent; and that carbonaceous solids at the rate of 223 lbs. per acre were more economical, increasing the yield 130 to 160 per cent. Further pot and plat experiments with turnips showed the value of pure calcium sulphid when used at the rate of 445 pounds per acre, but indicated that decreases might occur if such impurities as zinc sulphid were present. The writer concludes in general that the partial sterilization of soils in both field and orchard is feasible. (Exper. Sta. Rec., 41, 515.)—H. J. C.

583. *Effect of Excessive Sterilization Measures on the Germination of Seeds.* E. R. DE ONG. J. Econom. Entomol., Concord, N. H., 1919, 12, 343-345.

Varieties of wheat, corn, barley, oats, rye, rice, peanuts, alfalfa, peas, beans and almonds were sterilized by being exposed to heat (100°-158°, 124°-154°, and 125° F.), to cyanide (2 and 4 ounces to 100 cubic feet), and to carbon disulfid (30 and 40 pounds per 1000 cubic feet). Beans were found to be less susceptible to injury than is usually thought. As a whole, fumigation and heat sterilization are safe practices both for grains and legumes at the dosage commonly used, if proper precautions are taken as to the length of exposure and succeeding ventilation.—Z. N. W.

584. *Nitrogen Losses in Urine.* F. E. BEAR AND J. R. ROYSTON. J. Am. Soc. Agronomy, Lancaster and Wash., 1919, 11, 319-326.

In order to determine the conditions under which the greatest loss of nitrogen occurs in the storage of liquid manure, the writer kept cow urine in the laboratory under various conditions after inoculating it with fecal matter. Exposed to the air and kept at an average temperature of 38°C., 92 per cent of nitrogen was lost in 8 weeks; kept at an average temperature of 32.5°C., 92 per cent was lost in 12 weeks. Practically no nitrogen was lost when not exposed to the air, whether protected by a layer of kerosene, kept in a flask sealed except for a Bunsen valve, kept in closed flask with air, or in closed flask with air replaced by carbon dioxide. When absorbed by filter paper (to represent litter) 20 per cent of the nitrogen was lost in 8 weeks if the material was allowed to dry, while 97.5 per cent was lost when kept moist by the daily addition of water.—H. J. C.

585. *The Influence of Lime on the Nitrification of Barnyard Manure-Nitrogen in Arable Soil.*

CHR. BARTHEL AND N. BENGTSOON. Soil Sci., Balt., 1919, 8, 243-258.

A comparison was made of several methods for the determination of ammonia in the soil, all being subject to criticism. The Boussingault procedure was followed in the experiments with soils of different reaction. The addition of lime, in the form of calcium carbonate, and stable manure to cultivated soil of both neutral and acid reaction, showed that there was no favorable action of the lime on the nitrification of stable manure nitrogen, but on the contrary an impeding effect occurred where the supply of lime was very large, larger than is probably ever used in practice. Some theoretical explanations for these phenomena are advanced but the authors conclude that "at any rate these questions appear to be of no practical importance, for, as has already been pointed out, the lime does not exercise either an impeding or stimulating action when it is supplied in quantities which occur in practice."—N. K.

#### PLANT PATHOLOGY

586. *Investigations on the Mosaic Disease of the Irish Potato.* E. S. SCHULTZ, DONALD FOLSOM, F. MERRILL HILDEBRANDT AND LON A. HAWKINS. J. Agric. Research, Wash., 1919, 17, 247-274.

The distribution, effect upon yield, general appearance and transmission studies of a disease quite similar to the mosaic disease of tobacco are recorded. The symptoms of the disease may be modified or obscured by differences in environment or variety. Among other conclusions arrived at by the authors are:

"Tubers of diseased plants carry the disease.

"Grafting a healthy scion upon a diseased stock, or a diseased scion upon a healthy stock, may result in the development of the disease by the originally healthy scion or stock.

"Mosaic may be transmitted by transferring juice from a diseased plant to a healthy plant.

"At least two species of aphids can transmit potato mosaic, whether the aphids are transferred artificially or disperse naturally.

"Mosaic apparently tends to increase the sugar content of the leaves and to reduce their starch content."

Roguing or eliminating mosaic plants before aphids become abundant and isolation of the rogued seed plot seem to be effective in combating the disease.—P. L. G.

#### DAIRY BACTERIOLOGY

(See also Number 690)

587. *Report of the Milk Committee of the New Jersey Sanitary Association.* WILLIAM G. TICE. New Jersey Pub. Health News, Trenton, 1920, 5, 35-39.

This report is of more than local interest because it is based upon the results of recent investigations of the production of sanitary milk; and places chief stress upon the control of the quality of the milk itself rather than upon the sanitary condition of the place in which it is produced. The latter conditions are, however, not overlooked. The committee distinguishes between regulations governing the production of a clean milk and those necessary for the production of a safe milk, outlining in each case what they regard as the minimum requirements. It is recommended that only three grades of market milk be recognized; certified, raw milk, and pasteurized milk; the minimum requirements permissible for each are suggested.—R. S. B.

588. *The Detroit Commission Plan of City Milk Administration.* W. O. HEDRICK AND A. C. ANDERSON. Mich. Agric. Coll. Exp. Sta., East Lansing, Spec. Bull. 99, 1919, 30 pp.

According to the authors, this commission plan "had its success, first, by accepting the task of seeing that Detroit had an adequate supply of milk. Milk under this Commission plan was a city utility, the same as water, gas or electricity, and the Commission identified itself as being in the same class of boards as those of schools, parks or water supplies. In brief, it took the form of an executive commission rather than one of merely administrative or judicial duties."

"Second: The Commission benefited from the fact that both the country milk producers and the city milk dealers appeared as organizations, thus permitting collective treatment of their wishes and grievances. Each of these organizations, indeed, monopolized its respective field of service and the city consumer of milk would have had no adequate protection as to price had it not been for the commission plan."

"Third: The plan accepted cost of production as the basis from which milk prices to the consumer should be reached. These, of course, include dealers' costs, as well as the dairyman's and a small profit besides was allowed. Prices like this the city consumer must expect to pay. When more universal practices among the dealers and among the producers shall have standardized their costs no more just prices can be asked for by the city consumer than those based on expenses of production."

"The work of the Commission has clarified the view that milk is an indispensable city utility and it seems that an important step has been taken toward a suitable supervisory plan for the city milk supply."—R. S. B.

589. *The Milk Supply of Dublin.* D. HOUSTON. Coop. Ref. Libr., Dublin, 1918, 30.

Results of a survey show high bacteriological counts in milk supplied to Dublin.

The author does not expect that the exacting standards required by some American cities for market milk can be adopted at once, but urges that even considerably lower standards would work great improvement. In three appendices the complete report gives details of bacteriological examinations of milk samples and milk barns, together with specific suggestions for retailers. (Exper. Sta. Rec., 40, 283.)—L. A. R.

590. *The Necessity of Taking a Composite Sample of Milk when Grading Raw Milk by Numerical Bacterial Content.* R. S. DEARSTYNE AND L. R. JONES. J. Dairy Sci., Balt., 1919, 2, 506-508.

Data are given showing the bacterial counts from a series of night milk and morning milk samples from 8 dealers. The counts are correlated with mean daily temperature, methods of storage, length of haul and temperature of the milk at the time of delivery. It is shown that the samples taken from the night milk, presumably 12 hours older than the morning milk, almost consistently show a higher count than the latter; and it is pointed out that if, as is sometimes the case, samples are taken from night milk only, a dealer's product may receive a much lower rating than it deserves.—R. S. B.

591. *Observations on the Pasteurization and Subsequent Handling of Milk in City Milk Plants.* RUSSELL S. SMITH. J. Dairy Sci., Balt., 1919, 2, 487-503.

A general discussion of the efficiency of pasteurization and amount of recontamination of milk in city milk plants. Records of several tests of pasteurization efficiency are given and interpretations of results discussed. This is followed by records showing the amount of contamination derived from milk cans, bottles and caps.—R. S. B.

592. *Studies in the Clarification of Milk.* CHARLES E. MARSHALL. Am. J. Pub. Health, Concord, 1920, 10, 152-154.

Discussion in abstract form of the results accomplished by centrifugal clarification of milk. They indicate great efficiency in the straining out of dirt; the removal of cellular elements or masses of cellular elements; the removal of microorganisms, particularly the larger forms; production of advantageous types of after-changes following clarification. Discussion of the manner in which these results are accomplished.—I. S. F.

593. *Dry Sterilization of Dairy Utensils.* HARRIS MOAK. Hoard's Dairyman, Ft. Atkinson, 1920, 59, 274; 288.

Milk utensils including cans, pails and bottles were sterilized in a brick walled room 9 by 9 by 6½ feet heated to 270° F. by 500 feet of 1½ inch pipe holding steam at 80 pounds pressure.

Poor results are obtained if the utensils are placed in the room right side up but if they are inverted so that they drain properly and stacked so as to permit a circulation of air the results are satisfactory.

After one hour's exposure 40 quart cans rinsed with 99 cc. sterile water showed from 2 to 5 colonies per cubic centimeter. Similar results were obtained with pails and bottles.—L. A. R.

594. *The Carriage of Milk in Ventilated and Unventilated Churns Respectively.* J. GOLDING, ELFRIDA CORNISH AND R. STENHOUSE WILLIAMS. J. Board Agric., Lond., Suppl. 19, Dec., 1919, 32 pp.

This supplement includes two reports issued by the authorities of the Research Institute in Dairying at Reading at the request of the Board of Agriculture on the effect of ventilation of milk cans upon the quality of the milk. The first of these reports issued in November, 1914, reaches the conclusion that ventilation apertures in the cover or neck of cans serve no useful purpose, there being no detectable differences in the acidity or bacterial flora of milk carried in ventilated and unventilated cans respectively. It is also pointed out that the use of ventilated cans has been discontinued in other countries, and is dying out in England. The unpopularity of the ventilated churn is coincident with improvements in methods of milking and after treatment of milk. The remedy for "cow-smell" is stated to be the introduction of clean methods rather than the use of ventilated churns.

The second report issued January, 1916, discusses ventilation with filtered air. The conclusion is reached that the passage of filtered air through the milk does not exert any appreciable effect either upon its bacterial content, or upon the variation in the acidity of the samples. It cannot therefore be said that the filtered air tended to improve the keeping qualities of the milk.—R. S. B.

595. *Ueber die Leistungsfähigkeit des Lobeckschen Milchsterilisierungsverfahrens (Biorisation).* K. E. F. SHMITZ. Ztschr. f. Hyg. u. Infektionskrankh., Leips., 80, 233.

Shmits made a thorough investigation of Lobeck's biorisation method. The investigation showed that the characteristics of the raw milk were completely retained. This was shown in the taste and odor, in the fermentation reactions, in the quantity of the true whey proteins and in the extent of the bactericidal action. The strength of diphtheria antitoxin mixed with the milk was not influenced.

Only the ability to curdle with rennet was a trace smaller than in the raw milk. The ordinary milk bacteria were destroyed with the exception of the spore-formers.

Pathogenic bacteria added to the milk in large quantities are killed without exception not only at room temperature of 75°C. but also at 70-73°C. Because the spores contained in the raw milk are not killed there exists danger of peptonization. The biorised milk can be only doubtfully considered as a food for infants.

When it seems advisable to inhibit the peptonization this may be accomplished by inoculating with lactic acid bacteria or by a combination of the biorisation with the perhydrazide method of Much and Römer. The author concludes that biorisation may be employed for the killing of bacterial suspensions as well as for the sterilization of water. (Milchwirtsch. Zent., 1919, 48, 241.)—L. A. R.

596. *Vergleichende Versuche über Pasteurisierung und Biorisierung der Milch. (Comparative Investigation on Pasteurization and Biorisation of Milk.)* R. BURRI AND A. C. THAYSEN. Schweiz. Milchztschr., 1915, 41, No. 55-59.

Burri and Thaysen express their opinion of the biorisation method as follows: It will, from the hygienic and technical standpoint, effect a satisfactory reduction of the bacteria without appreciably affecting the characteristic properties of the raw milk. In this relation the results of this investigation support the favorable opinions which have been published many times. But it should not be forgotten that equal results can be obtained through a rational medium pasteurization of the milk. (Abs. in Milch Zentralbl.)—L. A. R.

597. *Electrical Sterilization of Milk.* Editorial. Sci. & Indust., Australia, 1919, 1, 6.

Amongst the investigations which the committee, dealing with this subject, proposes to carry out in the near future, is the application of direct current to the sterilization of ripened cream—a method which was found inapplicable by present methods in the sterilization of milk owing to the precipitation of casein. This experiment was actually planned, and the cream obtained for carrying it out, when the outbreak of influenza necessitated temporarily abandoning it. Experiments are also being planned for the sterilizing of milk in thin sheets by actinic rays. The apparatus for this experiment has been obtained, but the experiment itself was likewise held up.—Z. N. W.

598. *Milk and Cream Contests.* ERNEST KELLY AND GEORGE B. TAYLOR. U. S. Dept. Agr., Circ. 53, 1919.

The paper describes in detail methods of scoring milk and cream, and includes methods for preparing, collecting and testing samples both bacteriologically and chemically.—S. H. A.

599. *Studies Relating to Milk: I. The Preparation of Pure Casein.* L. L. VAN SLYKE AND J. C. BAKER. *II. A Method for Making Electrometric Titrations of Milk and other Solutions Containing Proteins.* J. C. BAKER AND L. L. VAN SLYKE. *III. Free Lactic Acid in Sour Milk.* L. L. VAN SLYKE AND J. C. BAKER. J. Biol. Chem., Balt., 1918, 35, 127-178; also N. Y. (Geneva) Agr. Exp. Sta., Tech. Bull. 65, pp. 54, 1918.

The first two papers included in this bulletin are primarily of interest to the dairy chemist, while the third includes matters of interest to bacteriologists as well. Previous work having shown that lactic acid exists in milk largely as lactate, with a smaller portion as free lactic

acid, the present work was undertaken to ascertain how much free lactic acid is present in sour milk. Part of the free acid is in solution while a smaller part is adsorbed by the casein. Each part has to be determined separately, 3 different methods being used for the first determination and 4 for the second determination. In addition to these observations, a study was made of the acidity of sour milks, the coagulation point of casein in sour milk and the first sign of souring.

Freshly separated pasteurized skim milk was inoculated with pure cultures of *Bacterium lactis acidii* and of *Bacillus bulgaricus* and incubated at 25°C. Unpasteurized milks inoculated with butter "starters" and allowed to sour normally were also studied. Unfortunately these chemists have not appreciated all the difficulties of bacteriological nomenclature and have used the terms *Bacterium lactis acidii* and *Streptococcus lacticus* as if they applied to different organisms. They also have not appreciated the importance of giving exact and correct information concerning the source and nature of the pure cultures used.

They found the total acidity by titration to vary from 70.5 to 220 cc. of n/10 acid per 100 cc. of milk; the free lactic acid, from 8.6 to 104 cc.; the acid as lactate, from 51.8 to 92 cc.; the pH value from 4.56 to 3.70. In milks souring under ordinary conditions, the total acidity by titration varied from 70.5 to 107.5 cc. of n/10 acid per 100 cc. of milk; the free lactic acid, from 13.1 to 34.5 cc.; the pH value from 4.43 to 4.02. The casein was found to coagulate when the pH-value reaches 4.78 to 4.64. During the coagulation the H-ion concentration was found to remain constant, though the acidity by titration increased slightly.

The first perceptible sign of souring was found to be a characteristic flavor discernible to the senses of both taste and smell, due to the presence of some volatile compound and not to lactic acid. The flavor appears before the milk begins to taste acid. No apparent relation was found between either the H-ion concentration or acidity by titration and the first sign of this flavor.—R. S. B.

600. *Carbonic Acid and Carbonates in Cow's Milk.* L. L. VANSLYKE AND J. C. BAKER. J. Biol. Chem., Balt., 1919, 40, 335-344; also N. Y. (Geneva) Agr. Exp. Sta., Tech. Bull. 69, pp. 9, 1919.

While this bulletin, like the preceding, is primarily of interest to dairy chemists, it also brings out the influence of pasteurization upon the CO<sub>2</sub> content. The authors find that the amount of CO<sub>2</sub> in fresh milk drawn from separate quarters varies from 7 to 86 per cent by volume and that the pH value (7.16 to 6.50) varies in a general way with the CO<sub>2</sub> content. When milk was pasteurized it was found that the CO<sub>2</sub> content is decreased while the pH value remains unchanged. When the CO<sub>2</sub> content was completely removed before pasteurization, then the pH value appeared to decrease slightly with pasteurization. It is suggested that these observed effects of pasteurization might be used as the basis of a method for distinguishing pasteurized from normal milk. CO<sub>2</sub> was found to exist in milk as H<sub>2</sub>CO<sub>3</sub> and probably as NaHCO<sub>3</sub>; the ratio being about one part of H<sub>2</sub>CO<sub>3</sub> to one of NaHCO<sub>3</sub>.—R. S. B.

601. *Conditions Causing Variation in the Reaction of Freshly-drawn Milk.* L. L. VAN SLYKE AND J. C. BAKER. J. Biol. Chem., Balt., 1919, 40, 345-356; also N. Y. (Geneva) Agr. Exp. Sta., Tech. Bull. 70, pp. 9, 1919.

"The investigation had for its object the study of the extent and causes of the variation of the hydrogen ion concentration in freshly-drawn milk." The pH-value of fresh milk was found to vary from 7.20 to 6.50, being under 6.76 in 80 per cent of the samples. Studies on samples from individual quarters of the udder indicate that the hydrogen-ion concentration of normal mixed milk, when fresh, is that representing the most acid reaction (pH 6.60 to pH 6.50), the variations all being in the direction of decreased acidity. It is suggested that such variations must be due either to a specific bacterial infection of the udder or to a more general constitutional condition, such as variation of base and acid relations in the blood stream.

In general, with decreased acidity, there is a marked tendency toward a decrease in sp. gr., and in percentage of fat, total solids, solids-not-fat, casein and lactose, but an increase in proteins other than casein, and in ash and chlorine. It is pointed out that these changes in composition are such as would be expected in case blood serum or lymph were added to normal milk. Examination of abnormal milks of low acidity, having a pH value above 6.80, indicated that the lessened acidity is accompanied by the presence of large numbers of leucocytes. In some cases however it was noted that the reaction was influenced by the presence of acid-producing streptococci. While the belief in the presence of blood serum or lymph in such milk was found to be supported by several considerations, a careful test for glucose proved negative.—R. S. B.

602. *A Method for the Preliminary Detection of Abnormal Milks.* J. C. BAKER AND L. L. VAN SLYKE. J. Biol. Chem., Balt., 1919, 40, 357-372; also N. Y. (Geneva) Agr. Exp. Sta., Tech. Bull. 71, pp. 14, 1919.

"The method is based upon the use of a dye called brom-cresol purple as an indicator. One drop of a saturated water solution of this dye is mixed with 3 cc. of milk and the color is observed. Normal fresh milk produces a grayish-blue color. The production of a darker or lighter color awakens suspicion in regard to the normal character of the milk. The color is made lighter by acids, acid salts, formaldehyde, and also by heating above the usual point



of pasteurisation. The color becomes deeper blue in the case of milk from diseased udders, watered milk, skimmed milk and milk containing alkali or alkaline salts. In the inspection of milk, a sample is taken for further detailed examination in the laboratory if the color is sufficiently lighter or darker than normal to indicate the probability of some abnormal condition."

"The method has been applied and results are reported in case of the examination of 570 samples of market milk. Watered milk was detected and also milk containing excessive numbers of leucocytes. A standard of colors can be made and conclusions more easily reached as to the normality or abnormality of samples examined."—R. S. B.

603. *The Determination of the Keeping Quality of Milk.* J. C. BAKER AND L. L. VAN SLYKE. J. Biol. Chem., Balt., 1919, 40, 373-382; also N. Y. (Geneva) Agr. Exp. Sta., Tech. Bull. 72, pp. 8, 1919.

If the brom-cresol purple test described in Tech. Bull. 71, is prepared with aseptic precautions, and the tubes are incubated for a given time at a given temperature, it then becomes a test for the keeping quality of the milk. The milk is examined for changes in color after certain intervals. The principal change indicated is the production of acid, but other things such as the coagulation of the casein, digestion of the casein, production of alkali, production of gas, abnormal odors and tastes are also shown.

Four stages of progress in the development of acidity are distinguishable through change of color. These vary from the grayish-blue of normal milk to the clear yellow of the sour milk, the intermediate stages showing mixtures of color. A comparison of results with a series of bacterial counts showed that high numbers of bacteria were in general correlated with rapid changes in acidity.—R. S. B.

604. *The Sanitary Quality of Milk as Judged by the Colorimetric Hydrogen Ion Determination.* L. H. COOLEIDGE AND R. W. WYANT. Mich. Agr. Exp. Sta., Quart. Bull., East Lansing, 1920, 2, 145-146.

See this Volume, Abs. No. 19.

605. *Lactic Acid Bacteria.* PETER PETERSON. Chicago Dairy Produce, 1919, 26, 24-32. A popular discussion of the use of lactic acid bacteria in buttermaking.—L. A. R.

606. *Occurrence of the Colon-Aerogenes Group of Organisms in Raw and Pasteurised Milk, and its Significance.* R. FINKELSTEIN. J. Dairy Sci. Balt., 1919, 2, 460-481.

The author has made a study of the colon-aerogenes content, (as determined by aesculin-bile-salt agar) of raw milk from the Ontario Agricultural College herd, of raw milk as sold in Guelph and as received both at the college pasteurising plant and at a commercial pasteurising plant, and also of the pasteurised milk from both of these plants. He concludes that the initial contamination of raw milk with members of this group averages less than 100 per cubic centimeter where care is used to 588 per cubic centimeter where indifferent methods are used. A temperature of 50° F., or lower, checked the growth of these organisms in raw milk, while temperatures of 70° F., or higher, caused them to increase rapidly.

Proper pasteurisation by the holding method was found to destroy practically all of the colon-aerogenes group leaving an average of 42 per cubic centimeter in the samples tested. The critical temperature for complete destruction appeared to be about 145° F. The author feels that the colon-aerogenes count in milk obtained on aesculin-bile-salt agar immediately after pasteurisation, is a valuable aid, in connection with the agar plate count, in controlling the process of pasteurisation. Suitable standards based on the results of his investigations are suggested.—R. S. B.

607. *A Score Card for City Ice Cream Plants.* F. W. FABIAN. J. Dairy Sci., Balt., 1919, 2, 515-518.

The author suggests a form of score card for use in the sanitary control of ice cream plants similar to that used for dairy farms.—R. S. B.

608. *The Catalase Content of Cheese.* J. M. SHERMAN. J. Dairy Sci., Balt., 1919, 2, 453-459.

While the author was engaged in making Emmenthal or Swiss cheese from milk treated with hydrogen peroxide, a great difference was noted in the catalase producing power of various types of bacteria. This led to a study of the catalase content of various types of cheese. Fourteen samples of domestic Swiss, 14 samples of American Cheddar, 8 samples of American Cheddar made from pasteurised milk, and 4 samples of imported Swiss were tested.

Cheese of the Emmenthal or Swiss type was found to be characterized by a high catalase content as compared with cheese of the Cheddar type. The greater hydrogen peroxide decomposing power of Swiss cheese was found to be due to its characteristic bacterial flora and a high catalase producing organism was found. This was isolated and inoculation experiments showed that this organism increased the catalase content of cheese when added to the milk previous to its manufacture.—R. S. B.

609. *Relation of the Enzymes of Butter to the Production of Tallowiness by Copper Salts and Over-neutralization.* L. S. PALMER AND W. B. COMBS. J. Dairy Sci., Balt., 1919, 2, 446-452.

"Tallowy butter was produced by the addition of 0.017 per cent copper lactate to both raw cream and cream which had been pasteurized at 79° to 80°C. In each of three such experiments typical tallowiness and bleaching occurred in the raw cream butter some time before it appeared in the butter made from the pasteurized cream."

"Samples in which over-neutralization of the cream was practised, previous to inoculation with copper lactate and ripening, failed to show any appreciable acceleration of tallowiness compared with samples not treated with alkali."

"The results of the experiments are discussed with reference to the chemical reactions involved in the tallowy decomposition. The view is favored that the natural oxidases of butter aid in producing tallowiness in butter made from raw cream or cream pasteurized at a temperature which does not inactivate the enzymes, rather than that hydrolytic enzymes of butter are essential for the splitting of the neutral fat into glycerol and fatty acid, the oxidation products of which are believed to cause the tallowy odor and flavor. The possibility of the metallic salts acting as hydrolytic enzymes is also suggested."—R. S. B.

610. *The Lecithin Content of Butter and its Possible Relationship to the Fishy Flavor.* G. C. SUPPLEE. Cornell Univ. Agr. Exp. Sta., Ithaca, Memoir, 29, 1919, 96-151.

The data presented show that there is in normal butter a sufficient amount of lecithin to yield, on decomposition, small quantities of trimethylamine, and that small quantities of this substance are essential for the manifestation of a fishy odor. When worked into butter under proper conditions, this substance produces a flavor described as fishy. The fishy flavor is secured most uniformly with trimethylamine butyrate. The author feels that this data indicates that trimethylamine is the probable cause of natural fishy flavor; but feels that more conclusive data should be obtained before it can be asserted positively. Trimethylamine was found in some samples of fishy-flavored butter but not in others. Much confusion in the recognition of the differences between fishy, oily, and metallic flavors complicates the problem.

The data indicate that a definite acid condition of the butter is essential for the development of the fishy flavor. This condition obtains when acids were artificially added as well as when naturally present. The results indicated however that this acid condition must be accompanied by some other condition determined by biological agencies. It appears that both of these factors must exist in a definite and delicate relationship, and that if the proper equilibrium is disturbed, the characteristic flavor is not manifest. Numerous observations indicate that the unknown transient factor is trimethylamine.

The bacteriological aspects of the problem involve the determination of the relationship just mentioned. The acid value of butter is to a certain extent regulated by biological factors, probably enzymes. Trimethylamine may be produced in milk and cream, probably to some extent from lecithin, with the consequent production of fishy flavor in these substances. Furthermore *Bacterium ichthyosmii* (isolated and described by Hammer) was found to produce the fishy flavor in milk and cream, and also under some conditions in butter. The conditions suggest that the growth of this or other similar species in the cream before it is made into butter determines the conditions necessary for the later manifestation of the fishy flavor.—R. S. B.

## COMPARATIVE PATHOLOGY

(See also Number 688)

611. *The Diagnosis of Rabies in Animals.* H. E. HASSELTINE. Pub. Health Rep., Wash., 1919, 34, 2378-2388.

From February 1, 1909, to April 30, 1919, specimens from 1003 animals suspected of rabies were examined by the Hygienic Laboratory. The diagnosis was made on the basis of the microscopical findings by the smear method. If Negri bodies were not found by this method, an emulsion of glycerinated hippocampus major was inoculated subdurally or intracerebrally into guinea pigs or rabbits. Of the 1003 specimens examined, 588 showed evidence of rabies, and 415 gave negative results. The colder months of the year have furnished the greatest number of specimens and the greatest percentage of positive findings. Of 289 specimens submitted to both microscopical and animal inoculation tests, the microscopical finding was confirmed by the animal test in 91.3 per cent of the cases. Of 406 specimens inoculated into animals there were 79 positive results.—C. E. T.

612. *Les Acanthocephales des animaux domestiques.* (The Acanthocephala of the Domesticated Animals.) A. RAILLIET. Rec. de méd. vét., Par., 1919, 95, 185-196.

A general article containing a review of the literature. There is given also a classification of the acanthocephala: three families, *Neoechinorhynchidae*, *Echinorhynchidae*, and *Gigantorhynchidae*. The last named is divided into two subfamilies: *Gigantorhynchinae* and *Prosthenorhynchinae*. To the former sub-family belongs the genus *Moniliformis* Trav., sp., *moniliformis* found in man; to the latter sub-family belong four genera, three of which are found in mammals: *Macroacanthorhynchus*, *Pardalis* and *Oncicola*. Three genera are given for the family *Echinorhynchidae*: *Corynosoma*, *Polymorphus* and *Filicollis*.—W. G.

613. *Glanders*. G. H. CONN. Am. J. Vet. Med., Chicago, 1919, 14, 590-594.

The author describes an outbreak of glanders among horses and mules in a remount station. It was demonstrated by autopsies that glanders was more acute in the mule than in the horse; that generalized glanders was more common in them than horses, and that the rapidity with which it developed was more pronounced than in the horse.—W. L. B.

614. *Beitrag zur Differentialdiagnose der Rotzkrankheit in pathologisch-anatomischer, ätiologischer und serologischer Beziehung*. (Contribution to the Differential Diagnosis of Glanders in its Pathological, Anatomical, Etiological and Serological Aspects.) W. PFLEGER. Centralbl. f. Bakteriologie (etc.), Jena. I. Abt., Orig., 1919, 83, 168-171.

The article discusses the danger of confusing by anatomical or pathological examination, or by serological test, a disease of the horse closely resembling glanders with the true glanders. It is pointed out that the organism producing this new disease causes the development of lesions and of immune bodies ordinarily regarded as specific for the glanders organism. He likewise noted that the new organism, when used as a vaccine, confers a relatively high degree of immunity upon horses toward glanders. No description of the organism is given nor any adequate method of differentiation from the glanders organism.—R. E. B.

615. *Weitere experimentelle Untersuchungen über aktive Immunisierung gegen Malleus*. (Further Experimental Investigation of Active Immunization against Glanders.) A. MÄXER. Ztschr. f. Immunitätsforsch. u. exper. Therap., Jena., 1919, 23, 410-433.

In connection with the veterinary work in the German army, several hundred horses were used by the author for the experiments described in this paper. Various preparations of the glanders bacillus were used for the immunization of horses. A vaccine prepared by killing the bacilli in 80 per cent glycerin was found to be effective as a means of immunizing horses, while ammoniacal solutions of the bacteria or glanders bacilli killed in tricresol were ineffective.

Complement fixation and agglutination tests with a glanders bacillus antigen became positive in the sera of animals treated with killed glanders bacilli, and the ophthalmic reaction was negative.

The virulence of the glanders bacillus for horses is shown by an experiment in which a horse was killed by the subcutaneous injection of 1/250000 of a drop of the culture.—S. B-J.

616. *Contribucion al estudio de la encefalo meningitis epizootica del caballo*. (A Contribution to the Study of Epizootic Meningo-encephalitis of the Horse.) C. F. FLORES. Rev. Soc. med. vet., Buenos Aires, 1919, 4, 35-42.

Post mortem examination of a horse killed at an advanced stage of the disease, and in which the characteristic nervous symptoms had been marked, revealed lesions that in some respects were comparable to those of septicemia. In the right hemisphere of the cerebrum were distinct foci of softening. Emulsions of brain from the softened areas, and cerebrospinal fluid and defibrinated blood were injected into the carotid. Some of the inoculated animals died in 3 or 4 days; but in others the disease ran a more chronic course, and did not end fatally until the twentieth and even the forty-fifth day.

The clinical symptoms in the inoculated animals were a mahogany discoloration of the conjunctiva, petechia of the nasal mucous membrane, elevation of temperature, marked debility, rapid emaciation, loss of appetite, constipation, incoordination of movements and oscillation of the hinder parts of the body. There were also fibrillary muscular twitchings. The post-mortem lesions were similar to those of hemorrhagic septicemia, with petechia or larger extravasations particularly in the epicardium and endocardium. Experiments with the emulsion after filtration through a Chamberland F candle seemed to show that the disease was not due to a filtrable virus. (Abstr. in Vet. Rev.)—W. A. H.

617. *Observations on Recurrent Ophthalmia at the Veterinary Bacteriological Laboratory, B. E. F., Italy, and at the Central Research Laboratory, Aldershot*. R. H. KNOWLES. J. Comp. Path. & Therap., Edinb. & Lond., 1919, 32, 192-197.

The presence of a microorganism in the eye has been said to be the cause of recurrent ophthalmia. It requires special technic or culture media for its isolation. That the so-called nerve bacillus plays any rôle in the etiology of the disease is left open to doubt. A non-specific agglutinin is present for the nerve bacillus in dilutions of 1-10 or sometimes 1-20 in the serum of normal as well as infected animals.—C. E. H.

618. *Contribution à l'étude de la lymphangite ulcéreuse du cheval, sa symptomatologie, sa thérapeutique et sa prophylaxie*. (A Contribution to the Study of Ulcerous Lymphangitis of the Horse, its Symptomatology, Therapeutics and Prophylaxis.) G. MULLIE. Rec. de méd. vét., Par., 1919, 95, 34-50.

A discussion of the history, pathogenesis, symptoms, differential diagnosis in particular, prognosis, treatment including (1) bacteriotherapy, (2) autopyovaccination, (3) intramuscular injections of a solution of methylene blue, a combination of (2) and (3), of the vaccine of Truche and (2), of (1) and (2), and of leucocytotherapy and antileucocytotherapy and finally of prophylaxis.—W. G.

619. *Traitement des lymphangites contagieuses du cheval par la pyothérapie.* (Treatment of Equine Contagious Lymphangitis by pyotherapy.) M. BELIN. Bull. Soc. centr. de méd. vét., Par., 1919, 95, 73-93.

A new technic for the preparation of a pyovaccine and a description of the method for its use. Reports are given of eleven cases of epizootic cryptococcus infections treated with the vaccine. There is also a discussion, with case reports, of bacillary lymphangitis lesions treated with pyovaccines. The author concludes the use of pyovaccines is the only rational method and is the most effective for the treatment of these infections.—W. G.

620. *L'oncocercose cervicale et le mal de garrot.* (*Onchocerca cervicalis* and *Fistulous Withers*.) M. RAILLIET. Bull. Soc. centr. de méd. vét., Par., 1919, 95, 111-116.

Attention is called to a number of cases of fistulous withers in horses associated with the filarial worm, *Onchocerca cervicalis*. A general discussion and references to the literature are given.—W. G.

621. *Cause étiologique et traitement de la dermite granuleuse.* (*Etiology and Treatment of Granular Dermatitis*.) R. VAN SACEGHEM. Ann. de méd. vét., Brux., 1919, 64, 151.

The larvae of *Musca domestica* raised in the laboratory as free from infection as possible were placed on fresh horse manure known to contain *Habronaema muscae* larvae. The fly larvae became parasitized by the *Habronaema* to the extent of 70 per cent. Numerous larvae were found in the proboscis as well as on the body of the insect. The infection is able to occur only during the larval stage.

In horses suffering from "summer sore" the author has frequently observed a conjunctivitis with typical small verminous nodules in it. A healthy horse was isolated and protected by mosquito netting and a few *Habronaema* larvae extracted from infested flies were placed in one eye. The result was a typical conjunctivitis with characteristic verminous granulation.

A horse with two similar wounds was placed in a stable where 20 per cent of the flies were infested with *Habronaema*, after covering one wound carefully with a protective dressing. The unprotected one developed into a typical "summer sore" while the other healed uneventfully.

The author feels that he has proven: (1) that erratic larvae of *Habronaema muscae* are the cause of "summer sore;" (2) that the domestic fly is the vehicle of the parasite; (3) that the larvae of *Habronaema muscae*, when deposited on a dry skin, are unable to persist, and die rapidly; (4) that the larvae are unable to pierce the skin; (5) that the larvae are able to fix themselves only in breaks of continuity of the skin or upon moist mucous membranes.

Treatment is prophylactic and curative. Prophylactic treatment should aim at the destruction of the adult of the *Habronaema muscae* in the stomach of the horse. The larvae may be destroyed by caring for the manure so that the proper heating will occur. This destroys the fly larvae as well as the *Habronaema*. All wounds during the hot months should be protected by dry dressings.—W. A. H.

622. *Sobre la enfermedad de los caballos.* (*Disease of Horses*.) J. LIGNIÈRES. Rev. Zootecnica, 1919, 6, 282-286.

For some time past a serious disease with nervous symptoms has made its appearance annually in the Argentine Republic. In 1911 Quevedo concluded that the disease was due to a toxemia resulting from alteration of the food in the intestine, and consequently wrote on it under the name of "le enfermedad de los rastrojos." In his general consideration of the disease, Lignières calls attention to a symptom that he thinks has not been sufficiently recognized. The first part of the respiratory tract—the mucous membrane of the nasal cavity—is intensely congested, of violaceous color, and slightly covered with mucin. Generally the pharynx is affected the same way. It is possible that the disease process may extend from the nose to the brain. (Abs. in Vet. Rev.)—W. A. H.

623. *Sobre la enfermedad de los equinos.* (*Disease of Equines*.) V. BOSSI. Rev. Zootecnica, 1919, 6, 339-342.

The various theories in regard to the etiology of cerebrospinal meningitis are reviewed. The clinical syndrome may resemble that of equine typhoid or influenza, and the symptoms are described as abdominal, thoracic, septicemic, exanthematous, and nervous or cerebrospinal. On the assumption that microbial toxins are developed in the gastro-intestinal tract, the nervous form of the disease has been called "balordone abdominal" (balordo = mad, frenzy). Bossi's investigations were made with an emulsion of softened areas of brain tissue derived from an animal suffering from the disease. (Abs. in Vet. Rev.)—W. A. H.

624. *Contribution à l'étude de l'ostéoporose au Congo belge.* (*Osteoporosis of the Horse in the Belgian Congo*.) R. VAN SACEGHEM. Bull. Soc. Path. exot. Par., 1919, 12, 238-243.

The author contends that rickets, osteomalacia and osteoporosis arise from identical causes. He suggests that there should be a common generic name to indicate all three conditions, and thinks that the term "osseous cachexia" is suitable.

Osteoporosis of equines is very common in the Belgian Congo and van Saceghem has sought for a cause in the amount of calcium content of soil and water. In those districts where the natural waters hold little or no calcium in solution (Lamba, Kitobola, Nyangwe)

osteoporosis occurs; while it never appears in those regions where the natural waters contain calcium (Zambi). The author therefore concludes that osteoporosis in the Congo is due to lack of calcium. (Abstr. in Vet. Rev.)—W. A. H.

625. *Accion traumatica del Strongylus equinus.* (Traumatic Effects of *Strongylus equinus*.) S. E. PARODI AND V. WIDAKOVICH. Rev. Zootechnica, 1919, 6, 277-282.

Generally the parasites were firmly attached to the mucous membrane of the large intestine and caecum and were little distances apart. In some cases the parasites were arranged in groups or colonies. The lesions described are grouped into four classes, (1) small wounds or punctures; (2) oedematous swellings; (3) small or large ulcerations, and (4) mucous or sub-mucous nodules.

The small wounds are produced by the fixation of the parasite in such manner that the mucous membrane of the intestine is sucked up into the buccal capsule. When the strongyle is detached, the mucous membrane presents a small papular elevation. Microscopically there is profound alteration of the mucosa involved. There is a complete disappearance of the tubular glands, their place being taken by a mass that presents a homogenous appearance, due on the one hand to necrosis of the tissues and on the other to an intense infiltration of eosinophile cells. In the interior of the necrotic magma the eosinophiles lose their outlines, blend with each other, and give the characteristic appearance to the necrotic lesions. More pronounced lesions are produced when many parasites are present. These consist of extensive edema that infiltrates the tissues and causes alterations in their cells. The arterioles are dilated and there is intense infiltration of eosinophile cells. In some of the cases observed by the authors, the edematous swelling of the wall of the caecum has been of some extent. In one case it was 1.2 meters in length.

Small or large ulcers are produced by the elimination of the necrosed part of the mucous membrane. Some ulcers are several millimeters in diameter. According to Weinberg, the healing of these ulcers depends on the virulence or otherwise of organisms introduced by the strongyles. Microscopic examination of the ulcers shows that the deeper part of the sub-mucous tissue is the site of a leucocytic infiltration and contains many microorganisms.

The mucous and submucous nodules contain larvae of the parasites. Some of the nodules are small, about 250 microns in diameter, and are situated immediately beneath the epithelium of the mucous membrane. The larger nodules are submucous and may attain the size of a hazel nut. They protrude into the intestine and may present a small orifice by which the larva has escaped. (Abs. in Vet. Rev.)—W. A. H.

626. *Clinical Aspects of a Fatal Disease Occurring at the Atlanta Stockyards.* H. W. BURKLAND. Am. J. Vet. Med., Chicago, 1919, 14, 549-550.

The author records an outbreak of an obscure fatal disease of mules and horses with a mortality of 70 per cent. Animals that did not develop the disease within 48 hours after being removed were regarded as having passed over the danger period.—W. L. B.

627. *Alypin in the Nervous Form of Distemper.* Tijdschr. v. Veeartsenijk., Utrecht, abstr. in Vet. Rec., Lond., 1919, 32, 181.

The writer advises the use of alypin in up to 5 centigrams per kilo body weight doses as a therapeutic agent for the nervous form of canine distemper. He injects it into the lumbar canal between the last lumbar vertebra and the sacrum. He has also used subcutaneous injections.—H. C. H. K.

628. *Joint Ill in Foals; Etiology.* H. MAGNUSSON. Comp. Path. & Therap., Edinb. & Lond., 1919, 32, 143-182.

Conceptions as to the etiology of joint-ill have been varying. One group of research men has insisted on congenital infection, another than the disease appears quite spontaneously. The first group considers that joint-ill and abortion in mares are caused by the same organism, the *Bacillus abortivo-equinus*. This organism is not neglected by the last group but the members of it contend that spontaneous joint-ill is caused by other organisms. Out of 314 foals examined, 236, or three-fourths suffered from joint-ills. Thus this disease is held to be the most important of all the diseases of the foal. Three organisms were found to be the cause of 90 per cent of the 236 cases of joint-ill. *Bacterium viscosum equi* was the cause in 73 cases, *B. coli* in 64, and streptococci in 75 cases. Mixed infections were not the cause of any of the 236 deaths. Death was caused by one kind of virus in each case. In cases caused by *B. viscosum equi* and *B. coli* the infection was early, the incubation period was short and the development swift.

Kidneys and joints show a more pronounced pathological change than any of the other organs. The organisms were isolated from these two structures more often than any others. The organism is easily killed. Foals are about the only animals that show any susceptibility in the experiments on pathogenicity.

Joint-ill persistently follows certain mares. This is not accepted as evidence of congenital infection. The supposition is advanced that the mare of such nature is the carrier of a powerful virus in the intestines and from that source the foal is infected. Most infections are held to be through the navel. Preventive treatment applied to the mare is thus of little avail and attention should be given to treatment of the foal. Painting the navel stump

with Tr. iodi is held to be good treatment when that is possible. Serum treatment and vaccination are indicated for this disease. Applied to foals showing highly developed lesions the serum treatment or vaccination is not effective. Foals ill right after birth should be treated with mixed streptococcus and coli serum, or coli serum alone, 50-100 grams. Those older than eight days should be given 100-200 grams of streptococcus serum alone. Injections should be made intravenously. Simultaneous vaccination with streptococcic vaccines in stables where joint-ill generally appears should be carried out. The occurrence of *B. viscosum equi* and other organisms in this disease reduces the chance of always getting positive results by serum treatment.—C. E. H.

629. *Ein neuer Strongyloides bei Füllen.* (A New Strongyloid in Colts.) J. WESTER. Centralbl. f. Bakteriologie. (etc.), Jena. I. Abt., Orig., 1918, 90, 370-372.

Description and photographs of new worm obtained from the feces of young colts.—M. L.

630. *Note sur la transmission de la fièvre aphteuse bovine à l'homme par la consommation du lait.* (The Transmission of Foot and Mouth Disease to Man by Milk.) H. PETIT. Rev. path. comp., 1919, 19, 7-8.

In a small village in Belgian Luxembourg where a typical outbreak of foot and mouth disease was raging, 20 cases of the disease were seen in human beings among about 300 population. The onset of the disease was marked by obstinate headache, fever, often vomiting and in two cases, epistaxis. The temperature remained between 39 and 40° for 3 days, and then fell for 1 or 2 days. During the earlier part of the disease there was stomatitis, gingivitis, some redness of the tonsils and fetid breath. In 3 cases toward the third day there were small circular ulcers of the gums, surrounded by a circle of inflammation. All the cases recovered in about a week. No cases occurred in houses, the cows of which were not affected nor did it occur in two places where the cows were affected but where the milk was fed to the pigs. (Abstr. in Vet. Rev.)—W. A. H.

631. *Progress in Tuberculosis Control.* J. A. KIERNAN. Am. J. Vet. Med., Chicago, 1920, 15, 1-7.

A review of the work done and the things accomplished since the plan of eradication of bovine tuberculosis was adopted.—W. L. B.

632. *Intradermal Tuberculin Test.* CLIFFORD ACKLEY. Am. J. Vet. Med., Chicago, 1919, 14, 588-590.

The author discusses the intradermal test as to its advantages over the thermal or subcutaneous test. He is of the opinion that the intradermal is far superior to the thermal test.—W. L. B.

633. *Fièvre bilieuse hémoglobinoïdique du boeuf d'Algérie, maladie distincte des piroplasmoses.* (Haemoglobinuric Biliary Fever of Cattle in Algeria, a Malady Distinct from the Piroplasmoses.) EDM. AND ET. SERGENT AND A. LHÉRITIER. Bull. Soc. path. exot., Par., 1919, 12, 108-120.

The Sergents and Lhéritier report the occurrence of a disease of cattle in Algeria for which they propose the specific name of hemoglobinuric biliary fever. It is an important and well-known disease, commonly called simply "jaundice." The chief symptoms are jaundice, hemoglobinuria and fever. The disease rarely lasts longer than 5 or 6 days, and sometimes the animal succumbs in 24 hours. The mortality of the disease has been reported as ranging from 5 to 20 per cent. Seeing that the chief characteristics of the disease are those of a piroplasmosis, and that *Piroplasma bigeminum* is known to occur in Algeria, cases of "jaundice" have generally been regarded as piroplasmosis. There were, however, certain paradoxical features that struck the Sergents and Lhéritier at the outset of their research. They have made observations upon natural cases and have conducted inoculation experiments which have led to the conclusion that the disease was not a piroplasmosis. The examination of the blood was negative in the majority of cases, and in others small, annular, or bacilliform piroplasms alone were demonstrated. *Piroplasma parvum* (*Theileria parva*) played no part in the etiology of the cases studied. Koch's bodies, characteristic of East Coast Fever were always extremely rare in the lymph glands, and they were found with equal rarity in control animals. Inoculation experiments with the blood of diseased animals were negative. The authors also argue that the disease is not caused by *Piroplasma mutans* because this organism was not more numerous in the blood of sick than it was in control animals; the number of organisms does not alter with the different phases of the disease, nor do they appear to be more numerous in animals inoculated with the blood or organs of diseased animals. Moreover, as already stated, the disease is not transmitted by inoculation. (Abstr. in Vet. Rev.)—W. A. H.

634. *Sulla recettività alla vaccinazione antipestosa dei vitelli nati da madre immune verso la peste bovina.* *Experimenti di siero-vaccinazione antipestosa (methode Kolle e Turner) in vitelli lattante e dopo la slattamento.* (The Receptivity to Anti plague Vaccination of Calves Born of Mothers Immune to Bovine Plague. Experiments upon Anti plague Sero-Vaccination (method of Kolle and Turner) in Suckling Calves and after Weaning.) P. CROBRI. Bull. Soc. path. exot., Par., 1919, 12, 65-71. Il Nuovo Ercolani, 1919, 24, 101-207.

The milk of an actively immune mother, partaken of by the calf in the natural manner, confers a passive immunity on the calf. The immunity is maintained during the period of suckling, and remains for some time after weaning, but not longer than three months. During the period when the calf is immune and during the period when it may react to vaccination in the manner in which the adult reacts, there exists a time when the calf is receptive, but the small amount of antibodies in the blood renders the reaction very feeble, and limited to a slight passing elevation of temperature or a slight lachrimation. (Abs. in Vet. Rev.)—W. A. H.

635. *Abortion Disease and its Control.* J. F. DEVINE. Am. J. Vet. Med., Chicago, 1920, 15, 7-12.

An article confined to the discussion of the mitigation or control of so-called abortion disease of cattle. Special emphasis was placed upon sanitation and isolation.—W. L. B.

636. *Beitrag zur Kenntnis der durch Erreger der Paratyphus-Gärtner-Gruppe hervorgerufenen Darmerkrankungen (Paracolibazillose) der Kälber. (Contribution on Intestinal Diseases of Calves Caused by the Paratyphoid-Gaertner Group.)* A. ZSHIESCHE. Centralbl. f. Bakteriol. (etc.), Jena. I. Abt., Orig., 1918, 80, 350-361.

*B. paratyphosus* B. is probably a more important etiological factor in intestinal affections of calves than has heretofore been accepted.—M. L.

637. *La coccidiose intestinale ou dysenterie coccidienne des bovins. (Intestinal Coccidiosis or Coccidial Dysentery of Cattle.)* A. RAILLIET. Rec. de méd. vét., Par., 1919, 95, 1-27.

An extensive review of the literature is followed by a discussion of the geographical distribution, methods and circumstances of infestation, symptoms, diagnosis, prognosis, pathological anatomy including a description of the first, second, third, and fourth stages of the macroscopic lesions and of the microscopic lesions, the prophylaxis and treatment, both specific and symptomatic.—W. G.

638. *Hemorrhagic Septicemia of Cattle with Special Reference to Stockyards Pneumonia.* H. PRESTON HOSKINS. Am. J. Vet. Med., Chicago, 1919, 14, 541-544.

The author has described in detail the nature of the disease, the symptomatology, course of the infection, together with the pathological conditions produced, and treatment.—W. L. B.

639. *An Obscure Trouble Affecting Cattle.* E. F. JARDINE. Am. J. Vet. Med., Chicago, 1919, 14, 567-568.

A disease of cattle is described which in some respects resembles hemorrhagic septicemia. Horses and sheep are apparently immune.—W. L. B.

640. *Contribucion al estudio de las epizootias suideas. El virus filtrable y el Bacillus suissepticus como agentes etiologicos en la pneumo-enteritis infecciosa del cerdo. (Contribution to the Study of Swine Epizootics. The Filtrable Virus and the Bacillus suissepticus as Etiological Agents in Infectious Pneumo-enteritis of Swine.)* A. DELGADO. Rev. Hig. y Sanidad Pecuarias, 1919, 9, 165-172.

Delgado thinks the belief that swine fever is due to a filtrable virus is not free from serious objection. In order to accept the doctrine in its entirety it would be necessary to make an analysis of innumerable cases of spontaneously occurring attacks of the disease. He holds that the inoculation of pure cultures of *B. suissepticus* is capable of producing an experimental disease, clinically and anatomico-pathologically indistinguishable from infectious pneumo-enteritis; and he is firmly convinced that it is possible to induce a strong immunity against pneumo-enteritis by the use of *B. suissepticus* under suitable conditions. (Abstr. in Vet. Rev.)—W. A. H.

641. *Un caso de alteracion constitucional de tipo osteomalacico en el cerdo. (A case of Osteomalacia in a Pig.)* R. SCASSO AND E. CHARLES. Rev. Zootechnica, 1919, 6, 348-350.

The case related in this article is that of a pig, aged three months, belonging to a litter of six animals, all previously healthy, kept for laboratory experiments. The first indication of illness in the young pig was a condition of malnutrition, though the appetite was good. About the same time it was observed that the gait was insecure, and that there was hyperesthesia, as elicited by placing the hand on the body. Shortly afterwards symptoms of osteomalacia became evident. The limbs were kept as rigid as possible, and any movement was accompanied by acute pain, as evidenced by the emission of querulous grunts. These symptoms became gradually more pronounced, and at the end of a month decubitus was permanent. Thirty days later, being in *extremis*, the pig was killed.

The caecum contained rounded lesions in which was caseous material. The liver was of normal size, but resistant to the knife and with a thickened capsule. Microscopically there was an increase in connective tissue, with diminution in the size of the lobules and hepatic cells. The spleen was sclerosed and also possessed a thick capsule. The kidneys were atrophic and deformed; their capsules were thickened and adherent, and the parenchyma was sclerosed. All the bones of the skeleton were deformed. The epiphyses of the long bones

were enlarged, while the diaphyses were shorter than normal and deformed. All the bones were soft and elastic; their medullary cavities were enlarged and the bony material could be easily cut with a knife. In comparison with the stunted condition of the body generally, the size of the head was striking, for it was large enough to have belonged to an older animal.

The authors are in doubt as to the etiology of the condition, and consider that their case cannot be explained by current theories, seeing that the patient had been fed on the same food as the other laboratory animals. (Abstr. in Vet. Rev.)—W. A. H.

643. *Zeigt der Ferkeltypus-Bacillus (Bac. Voldagsen Dammann und Stedefeder) ein labiles biochemisches und agglutinatorisches Verhalten.* (Does the Bacillus of Typhoid of Young Swine (B. Voldagsen Dammann and Stedefeder) Possess Labile Biochemical and Agglutinative Properties?) W. PFEILER AND F. ENGELHARDT. Ztschr. f. Immunitätsforsch. u. exper. Therap., Jena, 1919, 23, 434-446.

A study of the cultural and serological reactions of 100 strains of the Voldag bacillus, which is said to cause a typhoid-like disease in young swine. The school of Uhlenhuth has held that this bacillus, first described by Dammann and Stedefeder, is a secondary invader in animals infected with the virus of swine plague, and have described it as a very labile organism, showing remarkable morphological changes and shifting serological relationships. The authors compared strains which were freshly isolated with those which had been under cultivation for a year or more. Cultural, morphological and serological reactions were found to be constant among all strains. The organism closely resembles *B. suispestifer*, but is sharply differentiated by agglutination reactions from *B. paratyphosus* B. and Gärtner's bacillus.—S. B-J.

645. *Endemic Goiter.* HOWARD WELCH. Am. J. Vet. Med., Chicago, 1919, 14, 551-552.

A discussion of the relationship of goiter to the condition among swine known as hairless pigs. The condition is endemic and not sporadic. In certain parts of Montana pigs cannot be successfully raised without the use of iodine for the pregnant sows.—W. L. B.

644. *Ueber Komplementbindungsversuche bei Schafpocken.* (Complement Fixation in Sheep-pox.) R. MANNINGER. Centralbl. f. Bakteriol. (etc.), Jena. I. Abt., Orig., 1917, 80, 190-196.

Serum of affected animals contains amboceptors specific for antigen made by extracting crusts or tubercles in physiological salt solution. These antibodies are not present in serum of normal sheep.—M. L.

645. *Une affection non décrite du chien observée au Maroc.* (An Undescribed Disease of the Dog in Morocco.) H. VELU. Bull. Soc. path. exot., Par., 1919, 12, 132-134.

Dogs of almost all ages, breed, etc., were affected and the canine population was almost wiped out. Appearing about August, the disease reached its greatest intensity during September, and had almost died out by October. The symptoms recorded were very indefinite, and of a nervous, respiratory and digestive character. Nervous symptoms were always dominant, and gave rise at times to suspicion of rabies. From the commencement paraplegia and lack of coordination were marked. The patients could stand only when the fore legs were well spread apart. In many cases the back was arched, and the weight of the body almost wholly supported by the fore legs. When the animal could walk it did so in a hesitating staggering manner. At times spasms of the muscles were seen, especially of those of the jaws, in which case the teeth continually chattered. Response to external stimuli was much interfered with, and paralysis was rapidly progressive.

Respiratory symptoms occurred after a few days and were limited to the nasal region. A watery discharge appeared and later became muco-purulent. A painful cough was accompanied by marked dyspnoea. Appetite was retained throughout, but the food was always vomited, and emaciation was rapid. The eyes were sunken and the facial expression anxious. It was but rarely that a case recovered, death usually supervening in 8 to 10 days in paralysis and coma.

To the naked eye post mortem examination yielded negative results. So far all attempts have failed to transmit the disease by inoculation or cohabitation. (Abs. in Vet. Rev.)—W. A. H.

646. *Guérison d'une chienne inoculée avec "Trypanosoma marocanum."* (Recovery of a Dog Inoculated with *Trypanosoma marocanum*.) BOUIN. Bull. Soc. centr. de méd. vét., Par., 1919, 95, 96-100.

Dogs are very susceptible to this organism, 11 out of 12 inoculated dying. A description of the recovered case is given.—W. G.

647. *Observations on Diotophyme renale in dogs.* G. P. WISLOCKI. J. Parasitol., Urbana, Ill., 1919, 6, 94-97.

In the examination of 3200 dogs, of all ages, breeds, and sizes from the District of Columbia, Virginia, Maryland, and Pennsylvania, 12, or 0.37 per cent were found to harbor *Diotophyme renale*. Of these hosts 5 were males and 7 females. In every instance the parasites occurred free in the peritoneal cavity.—W. A. R.



648. *Bacteriology and Control of Contagious Nasal Catarrh (Snuffles) of Rabbits.* N. S. FERRY AND H. PRESTON HOSKINS. J. Lab. & Clin. M., St. Louis, 1920, 5, 311-318. See this volume, Abs. No. 42.

649. *Bacillus bronchisepticus as the Cause of an Infectious Respiratory Disease of the White Rat.* H. PRESTON HOSKINS AND ALICE L. STOUT. J. Lab. & Clin. M., St. Louis, 1920, 5, 307-310.

The authors report isolating *B. bronchisepticus* from the nostrils, nasal sinuses, trachea, lungs and heart blood of white rats suffering from a distemper-like disease. Agglutination tests suggest the identity of this organism with *B. bronchisepticus* isolated from dogs.—F. W. H.

650. *The Protozoal Parasites of the Rat, with Special Reference to the Rat as a Natural Reservoir of Spirochaeta icterohaemorrhagiae.* ALEXANDER G. R. FOULERTON. J. Path. & Bacteriol., 1919, 23, 78-103.

*Trypanosoma lewisi* was found in about 33 per cent of 123 London rats examined (*M. rattus*, 7; *M. decumanus*, 116). This large percentage suggests that the period of immunity after infection is short. Six London rats were examined for *Spirochaeta morsus muris* by allowing them to bite guinea pigs in the foot; the results were all negative. Other rats (*M. rattus*, 3; *M. decumanus*, 98) were examined for *S. icterohaemorrhagiae*. A guinea pig was inoculated from each rat; 4 of the 98 *M. decumanus* were infected and none of the others. Virus "111" was passed through 25 series of guinea pigs during which the virulence increased. Certain guinea pigs were found to be immune to ordinarily fatal doses. Emulsions made from the organs of guinea pigs and kept in cold storage for 72 and 96 hours retained their complete virulence. Apparently the infection of rats by *S. icterohaemorrhagiae* varies with the season since none was found from July to October among 82 rats and 4 cases were discovered in November among 19 rats.—R. W. H.

651. *Zehnjährige Erfahrungen mit "Ratin."* (Ten Years Experience with "Ratin.") L. BAHR. Centralbl. f. Bakteriologie (etc.), Jena. I. Abt., Orig., 1917, 80, 213-219.

Cites instances of successful employment of cultures of "Ratin" for eliminating rats. The pathogenicity of the organism is considered and discussed.—M. L.

652. *De l'existence à Marrakech et dans la région (Sud-Marocain) du "Trypanosoma Lewisi Kent."* (The Existence of *Trypanosoma Lewisi* Kent at "Marrakech" and in the Region of South Morocco.) BOVIN. Bull. Soc. centr. de méd. vét., Par., 1919, 95, 95-96.

Rats (*Mus decumanus*) were found to harbor the Trypanosome in their blood in about 23.33 per cent of 126 examined at all seasons of the year. From 10 to 30 organisms were found in each field. Dogs were inoculated but in no case did the Trypanosome appear in the blood, the only reaction being a rise in temperature especially in the very small dogs. *Trypanosoma lewisi* was not found in *Mus musculus*.—W. G.

653. *Gâle du dromadaire (Première note). Mange of the Camel. Preliminary Note.* EDM. SERGENT AND A. LHÉRITIER. Bull. Soc. path. exot., Par., 1919, 12, 94-99.

A description of *Sarcoptes scabiei*, var. *cameli* is given. Parasitic mange in the camel is a very serious condition which leads to marasmus and death if no treatment is applied. In a herd of camels seen in the springtime, every animal presented traces of mange and all were in poor condition. The lesions remained discrete for several weeks and then suddenly invaded the whole body. This generalization led to the death of the animals in from 1 to 3 months. Animals treated with soap and water and cresyl solution all died. Autopsy revealed pulmonary congestion. The dromedary is very sensitive to the effects of moisture applied to the surface of the body, the rectal temperature being lowered rapidly. The best treatment so far tried consists of a tar prepared from *Juniperus phoenicea* and *Thuya articulata*. This was successful when applied early, in a thorough manner and repeated. Dromedary mange is readily transmitted to man. (Abstr. in Vet. Rev.)—W. A. H.

654. *Observations on the Avian Paratyphoid Bacilli.* F. W. MULSOW. Am. J. Pub. Health, Concord, 1919, 9, 508-511.

Comparative studies of cultures of *B. pullorum* (Rettger) and *B. sanguinarum* (Moore), considered the etiological agents in "bacillary white diarrhoea" of chicks and "fowl typhoid" respectively, gave the following results: Both produce an initial acidity in milk cultures. This is followed by a change to an alkaline reaction as measured by litmus and brom-cresol purple. *B. sanguinarum* was found to be somewhat more variable in respect to this reaction than *B. pullorum*. Generally, both completely digest casein. Hydrogen sulphide is produced on lead acetate media by most avian strains. Dulcitol is fermented by all strains of *B. sanguinarum* and by none of *B. pullorum*. Maltose, sorbitol and rhamnose are less valuable for the purpose of differentiating these two organisms. The serological evidence points to closer relationship between these avian strains and *B. typhosus*, *B. enteritidis* and *B. abortus equinus* than between these and *B. paratyphosus* A and B, *B. suispestifer*, *B. coli*, *B. proteus*, *B. dysenteriae*, and *B. avisepticus*. To differentiate *B. pullorum* from *B. sanguinarum* the important points are: *B. pullorum* produces no acid from dulcitol, but generally does from maltose, ferments rhamnose more slowly, does not produce gas in carbohydrate media and usually forms alkali in milk in a shorter time than *B. sanguinarum*.—I. S. F.

## PARASITIC DISEASES

(See also Numbers 625, 650, 809)

655. *Nematodenzüchtung auf Agarplatten.* (Nematode Cultivation on Agar Plates.) HILGER-MANN AND RICHARD WEISSENBERG. Centralbl. f. Bakteriologie. (etc.), Jena. I. Abt., Orig., 1918, 80, 465-472.

An agar used for amebae was found suitable for growth of nematodes. Plates are seeded with bacteria at room temperature, and kept moist. Drying of surface causes death of nematodes.—M. L.

656. *Parasitologische Untersuchungen und Beiträge zur parasitologischen Technik.* (Studies on Parasitology and Contributions to Parasitological Technique.) B. GALLI-VALERIO. Centralbl. f. Bakteriologie. (etc.), Jena. I. Abt., Orig., 1918, 80, 264-271.

The more important parasites are listed, and methods for staining and study are briefly described.—M. L.

657. *On the Life History of Ascaris lumbricoides L. Part IV.* F. H. STEWART. Parasitology, Cambridge, 1919, 11, 385-387.

Two suckling pigs, four days old were given each about 22,000 ripe eggs of *Ascaris suilla*. On the 8th day after treatment both showed signs of pneumonia.

The first pig was killed 14 days after infection. No *Ascaris* larvae were found in the trachea or in a fragment of lung, but numerous specimens were found in the small intestine, caecum and rectum. No larvae were found in the second pig, killed on the 19th day. An experiment with a two months' pig was likewise negative.

Notes and drawings of the anatomy of the larvae from the first subject are given, which indicate that an ecdysis had occurred between the stages previously found in the trachea and these.—W. A. R.

658. *Présence de Trichocephales et d'oeufs de Trichocephales dans le foie de Mus decumanus.* (The Presence of *Trichocephalus* and the Eggs of the *Trichocephalus* in the Liver of *Mus decumanus*.) L. MURATET. Compt. rend. Soc. de biol., Par., 1919, 82, 1383.

Cases of parasitism as indicated were observed.—G. H. S.

659. *Strongyloides Westeri n. sp.* (*Strongyliodes westeri n. sp.*) J. E. W. IHL. Centralbl. f. Bakteriologie. (etc.), Jena. I. Abt., Orig., 1918, 80, 372-373.

Brief description of the worm isolated from excrement of young colts.—M. L.

660. *Parasitized Kabeljaauw and Cape Salmon.* W. WATKIN PITCHFORD. Med. J. S. Africa, Johannesburg., 1919, 15, 101-104.

Attention is drawn to parasites in the flesh of these two staple food fishes.

The parasite takes the form of a cyst, to which is attached a long slender worm-like tail. The cysts with their attached tails are found between the muscle bundles and a large percentage is grossly infested. This parasite has been identified as *Tetrarhynchus erinaceus*. No instance is recorded of its being found in human beings. The paper contains an excellent description of the larval stage. The adult form is found in sharks and rays. It does not seem to affect the fish, the flavor is good and they appear to be wholesome. In the discussion the author has called attention to the finding of the larval type of *Taenia solium* and *Taenia saginata* in human beings. In one case a soldier was found to have the scolices of *Taenia solium* in subcutaneous cysts near the margin of the orbit.—C. P. B.

## TROPICAL DISEASES

661. *The Occurrence of Malaria Parasites in Anopheles crucians in Nature.* BRUCE MAYNE. Pub. Health Rep., Wash., 1919, 34, 1355-1357.

The 3 American species of *Anopheles*, namely *A. quadrimaculatus*, *A. punctipennis*, and *A. crucians*, have been reported as capable of harboring the organisms of malarial fever under experimental laboratory conditions. Several workers have discovered American *Anopheles* in the rôle of carriers, under natural environments. *Anopheles quadrimaculatus* has been found both with oöcyst infection of the gut and with salivary gland sporozoites. *A. punctipennis* has been found only once with stomach infection, and that with a single oöcyst. For the first time *A. crucians* has been found infected in nature. The gut wall was found negative, but the salivary glands were found infested with sporozoites.—C. E. T.

662. *Occurrence of Malaria and Anopheline Mosquitoes in Middle and Southern California.* Month. Bull. Calif. State Bd. Health, 1920, 15, 211-216.

The relation of anopheline mosquitoes to the malarial death rate is brought out in this paper.—F. W. T.

663. *The Business Malaria Control.* S. B. FREEBORN. Month. Bull. Calif. State Bd. Health, 1920, 18, 217-220.

Mosquito control work on 21 projects average to cost \$2.53 per acre. Legislative authorization for levying taxes for this purpose may raise funds and also place the burden on responsible parties.—F. W. T.

664. *Drainage as an Anti-Malaria Measure.* J. A. LePRINCE. Am. J. Pub. Health, Concord, 1920, 10, 120-123.

Farm drainage is not the same as Anopheles drainage. Farm drainage, by means of broad shallow ditches, after carrying off the storm water often furnishes excellent breeding places for Anopheles. Subsurface or tile drainage is an effective method of controlling the malaria mosquito and in the long run may be decidedly cheaper than Anopheles control.—M. C. P.

665. *Anti-Malarial Work with the Australian Mounted Division in Palestine.* W. EVANS. Med. J. Australia, Sydney, 1919, 6th year, 2, 526-529.

Anti-malaria work in the valley of the Jordan was attended with great difficulty and could be only partly successful because the natives made no effort to control the breeding places of the mosquitoes. In the Jordan there was little breeding but its tributaries, some of which ran through swampy territory, were heavily infected. The incidence of the disease was high especially in one organization which had a sick rate of 75 per cent for one or two nights in the Jordan Valley. At first organizations taking quinine prophylaxis—0.6 gram daily—had a malarial incidence, only about half those not taking it, but later the figures became equal so that quinine seemed only to delay the onset. These studies are important in that there are about eighteen thousand potential malaria carriers in Australia.—C. P. B.

666. *Mosquito work of the Bureau of Entomology.* D. L. VANDINE. Am. J. Pub. Health, Concord, 1920, 10, 116-119.

A brief history of the mosquito investigations from 1890-1913 are given. The typical breeding places and habits of Anopheles, the malaria mosquito, are discussed with ways and means for combating disease spread by mosquitoes.—M. C. P.

## MEDICAL ENTOMOLOGY

(See also Numbers 629, 647, 714)

667. *Deer-fly Fever or Pahvant Valley Plague.* EDWARD FRANCIS. Pub. Health Rep., Wash., 1919, 34, 2061-2062.

In recent years a disease has occurred among the rural population of Millard County, Utah, initiated, according to popular belief, by a fly bite, and manifested by the enlargement of the lymph glands which drain the bitten area and by the fever of a septic type lasting from 3 to 6 weeks. There is marked prostration and the lymph glands commonly suppurate.

From a typical case of deer-fly fever, two series of guinea pigs and rabbits were inoculated, one with the patient's blood and the other with pus obtained from a suppurating cervical gland of the patient. Both series of animals developed a disease which proved fatal in a few days, and at post mortem exhibited caseation of the lymph glands and small necrotic foci throughout the liver and spleen. Subinoculations with lymph glands, liver, or spleen of infected animals invariably reproduced the same lesions. Cultures made on ordinary laboratory media from the lesions were negative, but cultures made upon coagulated egg yolk yielded a growth of small nonmotile coccobacilli, which reproduced the lesions in guinea pigs. McCoy and Chapin had found in 1912 a similar organism, which caused a plague-like disease in the ground squirrels of California. This organism, called *Bacterium tularense*, is probably identical with the organism causing deer-fly fever.—C. E. T.

668. *The Systematic Position, Synonymy, and Iconography of Pediculus humanus and Phthirus pubis.* G. H. F. NUTTALL. Parasitology, Cambridge, 1919, 11, 329-347.

The order Anoplura as constituted by Leach, in 1817, included both the sucking lice, *Siphunculata* Meinert 1891, and the biting lice, *Mallophaga* Nitzsch 1818. A review of the subsequent attempts at classification and of the present day evidence showing close relationship of these two groups leads to the conclusion that they should be regarded as sub-orders of a single order, to which the name Anoplura should be restored, there being no justification for continuing to apply it to the *Siphunculata* alone.

As for the validity of the species *capitis* and *corporis* the conclusion based on morphological data is that they represent the extremes in the variation of the one species, *Pediculus humanus*, and that they are identical in all essential points of structure. This is supported by the biological evidence, which indicates that the race *corporis* is descended from *capitis*.—W. A. R.

669. *Hermaphroditism and other Abnormalities in Pediculus humanus*. D. KEILIN AND G. H. F. NUTTALL. Parasitology, Cambridge, 1919, 11, 279-328.

Detailed descriptions accompanied by numerous drawings are given of 155 hermaphroditic lice. A complete series of forms beginning with those of male type and ending with those of female type was found, the coexisting characters of both sexes being present to a varying degree.

None of the specimens studied accord in any way with "halved gynandromorphs" but they resemble the "intersexual forms" of Goldschmidt. The state of development of the gonads is not in accord with that of the secondary sexual organs. The anatomical structure indicates that the hermaphrodites may be either sexually non-functional or functional, serving, in the latter case, as males or females in respect to copulation.

Most of the specimens studied were obtained from laboratory crosses between the head and the body louse, some families of these giving as high as 20 per cent hermaphrodites. Since both races have ample opportunity for crossing in nature and since the hermaphrodites found among wild pediculi are morphologically similar to those obtained from the crosses it is concluded that they are similarly derived.

It is further noted that when head lice are bred in boxes they gradually acquire all of the morphological characters of the body lice. The two supposed species *capitis* and *corporis* constitute but races of *Pediculus humanus*.—W. A. R.

670. *Further Observations on the Habits and Parasites of Common Flies*. G. S. GRAHAM-SMITH. Parasitology, Cambridge, 1919, 11, 347-384.

In trapping experiments conducted for three years the curve indicating the number of flies caught corresponds with the curve of the maximum temperatures recorded by a thermometer exposed in the sun.

Flies spend a very large proportion of their time in cleaning themselves, and the procedures usually follow each other in a definite order.

Empusa disease occurs in several species of flies. Certain Gamasid mites destroy both eggs and young larvae, while the beetles *Creophilus maxillosus*, *Necrophorus humator*, *Hister cadaverinus*, and *Pterostichus madidus*, were observed to destroy large numbers of puparia.

Numerous hymenopterous parasites were obtained from naturally infected puparia. Cynipidae, Proctotrypidae, Ichneumonidae, Chalcididae, and Braconidae were bred, infection with species of the last two families being very common.—W. A. R.

671. *On the Resistance to Desiccation of the Intermediate Host of Schistosoma japonicum*. Katsurada. W. W. CORT. J. Parasitol., Urbana, Ill., 1919, 6, 84-88.

Specimens of the operculate snail *Blanfordia nosophora*, the intermediate host of the Japanese blood fluke, which had been shipped to California from Japan in a dried condition, became active when placed in water. This seemed of such practical importance as to warrant further study.

It was found that the resistance to desiccation of this snail is limited to about 3 months. It unfavorably affects the cercariae within the snails and infected snails succumb more quickly than uninfected. Individuals of *Blanfordia nosophora* will voluntarily leave the water and become dry under unfavorable conditions.

It appears, then, that measures for the control of Japanese schistosomiasis by draining the breeding places of *Blanfordia nosophora* would be fully effective only if these places were kept dry at least three months.—W. A. R.

672. *Intestinal Protozoa Found During Acute Intestinal Conditions amongst Members of the Egyptian Expeditionary Force 1916-1917*. F. W. O'CONNOR. Parasitology, Cambridge, 1919, 11, 239-255.

All stools from diarrheal cases were examined as often as necessary—sometimes six times—for *Entamoeba histolytica* and other protozoa. *E. histolytica* was discovered in 156 cases, or 7.5 per cent, of the white troops examined. The parasite was found most frequently amongst Indian troops and then, in order, in healthy Egyptians, sick Egyptians, and white troops. No evidence of pathogenicity of this species was noted in the 923 cases studied. *E. nana* occurred in 158 cases, and in these likewise there was no evidence of pathogenicity.

*Trichomonas hominis* was found in 110 out of 2848 examinations. No clear evidence of its pathogenicity was found. *Lambdia intestinalis* was present in 186 instances, *Chilomastix mesnili* in 147, *Tricercomonas* in 16, and *Isospora hominis* in 9.—W. A. R.

673. *Observations on the Biology of the Ixodidae. Part III. Dealing with the Behaviour of the Sexes in Amblyomma hebraeum, Hyalomma aegyptium and Rhipicephalus bursa when on the Host*. G. H. F. NUTTALL. Parasitology, Cambridge, 1919, 11, 393-404.

In *A. hebraeum* the females seek the males, in *H. aegyptium* and *R. bursa* the males seek the females. In all three species the males remain on the host indefinitely after the females have dropped off.

The predominance of male ticks of any species upon a host under natural conditions is accounted for by their staying on the host and accumulating while successive lots of females drop off. Since the liability to injury increases with the degree of engorgement it is a great safeguard that the female attains the full state rapidly and that she drops from the host promptly.—W. A. R.

674. *Sarcosporidiosis in an East Indian.* S. T. DARLING. J. Parasitol., Urbana, Ill., 1919, 6, 98-101.

Of the two undoubted cases of sarcosporidiosis in man on record, Darling has reported one and now adds a third. The host was a Mohammedan coolie from British India, who had lived for two years in the Federated Malay States. There was no evidence whatever of degeneration or inflammatory change, not even the slightest in the neighborhood of the sarcocysts. The source of the infection is unknown.—W. A. R.

675. *Tsetse-flies and Trypanosomiasis. Some Questions Suggested by the Later History of the Sleeping Sickness Epidemic in Uganda Protectorate.* H. L. DUKE. Parasitology, Cambridge, 1919 11, 415-429.

A critical review of the results of repressive measures adopted in Uganda in 1907 leads to the conclusion that the bioeconomic problem created by the tidal wave of sleeping sickness which swept this region is not solved, but that it has merely passed from the stage which called for measures designed to prevent further destruction of life and values into a new stage calling for the substitution of reconstructive for preventive measures. The main and most important feature of these measures must be to replace the populations, whole tribes of which had been expatriated, and to recover economic values, but at the same time to preclude absolutely the possibility of another devastating pestilence. This effort is in every way as important and necessary as the effort to prevent further destruction.

While presenting his "working hypothesis" with much reservation, the author inclines to the view that in determining future policy reconstructive effort may be based on the assumption that very broad contact between fly and population is a prime essential to the occurrence of sleeping sickness in the form of a widespread epidemic.—W. A. R.

676. *Anopheles crucians* Wied, as an Agent in Malaria Transmission. C. W. METZ. Pub. Health Rep., Wash., 1919, 34, 1357-1360.

In attempting to ascertain whether *A. crucians* is or is not of practical importance from a sanitary standpoint, the relative frequency with which it bites man under conditions suitable for malaria transmission was determined. It was found that *A. crucians* frequents dwellings in much fewer numbers than privies and other outbuildings, while with *A. quadrimaculatus* the situation is reversed. From an examination of 1757 specimens, many of which were from localities in which infection was found, it seemed that the percentage of infected specimens was approximately the same for both species. There seems to be no doubt, therefore, of the susceptibility of *Anopheles crucians* to infection with malaria plasmodia under natural conditions, although the habits of the species are probably less conducive to natural infection than are those of *A. quadrimaculatus*.—C. E. T.

677. *Fishing in Relation to Mosquito Control in Ponds.* SAMUEL F. HILDEBRAND. Pub. Health Rep., Wash., 1919, 34, 1113-1128.

It was discovered in the extra-cantonment zone at Camp Hancock, Augusta, Ga., that the species "*Gambusia affinis*," or top minnow, was very effective in destroying mosquito larvae. The reasons for this are, (1) it seeks its food at the surface of the water; (2) it is very prolific; (3) it gives birth to well-developed young, therefore requiring no special environment for depositing and hatching the eggs; (4) it lives and thrives under a large variety of conditions and frequents areas especially suitable for the support of mosquito larvae, and (5) it usually lives and multiplies in ponds stocked with predacious fishes, providing it has very shallow water for refuge.

Plants which form floating masses are the chief sources of protection for mosquito larvae against the top minnow and should be removed or made uninhabitable for the miniature mosquito. Mosquitoes, however, may breed in water so badly polluted that *Gambusia* is almost instantly killed thereby. The number of top minnows necessary in a body of water in order to secure mosquito control depends largely on the number of hiding places for the mosquito larvae against fish.—C. E. T.

678. *Observations on the Food of Anopheles Larvae.* C. W. METZ. Pub. Health Rep., Wash., 1919, 34, 1783-1791.

Through a series of experiments made to ascertain the essential food requirements of *Anopheles* larvae, it was found that either animal or vegetable food is suitable. It apparently makes little difference whether the food be living or dead. It was found, however, that pollution or decomposition is detrimental to the growth of the larvae. Since this may often be prevented by aeration, it is apparently due to an excess of CO<sub>2</sub>. Contrary to popular belief, a pure water, if it contains sufficient food, is better than stagnant water for *Anopheles* breeding.—C. E. T.

679. *Die Parasiten der Stechmückenlarven. (The Parasites of the Mosquito Larvae.)* E. BRESSLAU AND M. BUSCHKE. Biol. Centralbl., Leipzig, 1919, 39, 325-336.

A review of the literature concerning nematode and protozoan parasites of mosquito larvae and a description of a new species of the schizogregarine *Cauleryella pipientis* from the intestine of the larvae of *Culex pipiens* L.—R. E. B.

680. *Zur Systematik der einheimischen Stechmücken. 2. Vorläufige Mitteilung: Die Larven. (The Classification of the Native Mosquitoes. 2. Preliminary Contribution. The Larvae.)* FRITZ ECKSTEIN. Centralbl. f. Bakteriol. (etc.), Jena. I. Abt., Orig., 1919, 83, 281-294. Descriptions and keys are given to the larvae of three species of anophelines, five species of culicines, and ten species of aedines.—R. E. B.

681. *The Incubation Period of the Eggs of Haematopinus asini.* A. BACOT AND L. LINZELL. Parasitology, Cambridge, 1919, 11, 388-392.

As the sucking louse *H. asini* is the most important of the three species of lice infesting horses, experiments to determine the incubation period of the eggs were undertaken, in the hopes of fixing some definite period during which dressings are necessary to prevent reinfestations.

It was found that the eggs of *H. asini* may take as long as a month or more to hatch. Therefore, infested animals must be kept under observation and the last dressing given not less than 34 days after the treatment started. From analogy with other forms it is thought that the minimum period is about a fortnight. This would mean that if the treatment is repeated at ten-day intervals, four dressings must be given.

Most of the dressings in common use in veterinary practice for the treatment of lousiness in horses will, if carefully applied, suffice to kill all the living parasites.—W. A. R.

682. *Trematodes Produced in South African Snails: Encysting Cercariae.* F. G. CAWSTON. J. Comp. Path. & Therap., Edinb. & Lond., 1919, 32, 210-212.

Two encysting cercariae were found infesting fresh water snails. They are named *C. rondosa* and *C. pigmentosa*. The first are found in a large proportion of *Isidora schakoi jickeli*. The second are found infesting *Limnaea natalensis* only. There are at least two distinct species of *Amphistomum* that attack sheep and cattle. Neither the larval stage nor the intermediary host of the *Distomum* have been determined in South Africa. The cercaria infested snails were the source of sickness among horses that were allowed to graze in the neighborhood of infested pools.—C. E. H.

683. *On the Life-history and Larval Anatomy of Melinda cognata Meigen (Diptera Calliphorinae) Parasitic in the Snail Helicella (Helomanes) virgata DaCosta, with an Account of the other Diptera Living upon Molluscs.* D. KEILIN. Parasitology, Cambridge, 1919, 11, 430-455.

The eggs of the fly *Melinda cognata* are deposited in very small numbers in the mantle cavity of the snail and the emerging larva bores into the kidney on which it feeds. During the second stage it grows rapidly, enlarges the kidney and lies in the mantle cavity with its ventral side towards the shell of the snail. Passing to the third stage it becomes very voracious, attacking next the liver and all the organs of the host in turn. When full grown the larva leaves the shell of the putrefied snail, penetrates into the earth to pupate and about 14 days later the adult emerges. The development from egg to pupa requires about 15 days, so the complete cycle occupies about a month.

Detailed descriptions of the early stages of *Melinda cognata* are given. There then follows an account of all of the Diptera feeding upon living and dead molluscs. Of these, 4 species are parasitic, 1 carnivorous, 2 epizotic, and 36 "saprophagous larvae and doubtful parasites."—W. A. R.

684. *Notes on North American Myxosporidia.* H. B. WARD. J. Parasitol., Urbana, Ill., 1919, 6, 49-64.

Descriptions and data on three new species of Myxosporidia.

*Myxobolus auratus* nov. spec. was found between the fin membranes of the minnow *Notropis anogenus*, in Lake Erie. The infection was markedly conspicuous, the cysts appearing as oval bodies "perfectly opaque and glittering like a mass of metallic gold." They lay between the ectodermal layers of the fin membrane. The usually accepted view that the color belongs to the host tissue is certainly not applicable to this case, for the color belongs to the cyst and cannot be separated from it in life.

*Henneguya brachyura* nov. spec. was found on the caudal fin of one of the minnows infected by the above species. The cysts were rounded, with slightly irregular contour and imbedded in the fin ray. In size they varied from 160  $\mu$  in diameter up to 360 by 240  $\mu$ .

*Henneguya salminalis* nov. spec. occurs in pyriform whitish cysts in the connective tissue in body muscles of Alaskan salmon. A zone of pale whitish flesh surrounds the cysts to the width of 6-8 mm., in clear contrast to the bright pink muscle.

Details of spore structure and measurements are presented and in addition to text figures the paper is illustrated by a colored plate.—W. A. R.

685. *Two New Proteocephalidae.* E. C. FAUST. J. Parasitol., Urbana, Ill., 1919, 6, 79-83.

*Proteocephalus pychocheilus* from the cyprinid, *Ptychocheilus oregonensis* and *Proteocephalus laruei* from the salmonid *Coregonus williamsoni* are described in detail. Both were taken in Montana.—W. A. R.

686. *The Genus Lernaepoda. Including a Description of L. mustelicola n. sp., Remarks on L. galei, and Further Observations on L. scyllicola.* H. H. LEIGH-SHARPE. Parasitology, Cambridge, 1919, 11, 256-266.

The scope of this paper is sufficiently indicated by the title. Considerable morphological detail presented.—W. A. R.

687. *A Mouse Oxyurid, Syphacia obvelata as a Parasite of Man.* W. A. RILEY. J. Parasitol., Urbana, Ill., 1919, 6, 89-92.

A Bohemian-American child living in the Philippines was found to be heavily infested by the mouse tapeworm, *Hymenolepis murina* and in addition, to harbor nematode worms of the Oxyurid type. These proved to be *Syphacia (Oxyuris) obvelata*, a common parasite of mice. All five members of the family to which the child belonged were heavily infested by the tapeworms, an indication that they had partaken of food grossly contaminated by mice or rats. Only in one case was there possible microscopic examination necessary to determine whether the nematodes were also present.—W. A. R.

## EPIDEMIOLOGY

688. *The Rat as a Carrier of Diseases Transmissible to Man and to the Lower Animals.* ALEXANDER G. R. FOULERTON. J. Comp. Path. & Therap., Edinb. & Lond., 1919, 32, 182-192.

Spirochetal infections, rat tuberculosis, a form of bacillary pseudotuberculosis, plague and a form of worm infestation—trichiniasis—are diseases of rats having special interest in connection with the diseases of man and other animals. Bubonic plague of man and rat plague show epidemic prevalence at the same time as a rule. Transmission of plague to man from rats is most likely to occur by means of contaminated food and dust. The rat may play a very important part in keeping the virus of plague alive through the winter in temperate zones. Weil's disease or spirochetal jaundice may be transmitted by rats to man through the agency of bites or contaminated food. Rat-bite fever may be communicated by means of the same agents. The rat plays an important part in the transmission of trichiniasis since it spreads the disease among pigs through which the disease is transmitted to man. Any known pathogenic parasite which is capable of living in the intestine of the rat for any length of time may be transmitted to man or the other animals.—C. E. H.

689. *Typhoid in the Large Cities of the United States in 1918; Eighth Annual Report.* J. Am. M. Ass., Chicago, 1920, 74, 672.

Detailed figures are given showing the continual lowering of typhoid death rates in American cities. The rate for the whole group of sixty cities containing about one-fourth of the population of the country is less than five. In 1912 there was only one city with a rate less than five and in 1916 there were only three cities with a rate of two or less. Now there are eight. The large reduction of typhoid in 1919 may be attributed in part to immunization in the army camps and the safeguarding of water and milk supplies. Investigation of the circumstances surrounding each individual case will further reduce the typhoid rate. The practical elimination of typhoid is a probability of the near future.—P. G. H.

690. *Further Evidence as to the Relative Importance of Milk Infection in the Transmission of Certain Communicable Diseases of Man.* EUGENE R. KELLEY AND STANLEY H. OSBORN. Am. J. Pub. Health, Concord, 1920, 10, 66-73.

The work is based on investigations by the district health officers of the Mass. State Board of Health from 1915-1918 inclusive. Milk, while a dangerous factor, is not of great quantitative importance provided prompt investigations are instituted as a routine procedure of all cases occurring on milk producing and milk handling premises. Milk as a source of diphtheria and scarlet fever is practically negligible; 7.7 per cent of the total number of typhoid cases reported were attributed to milk infection. Increased pasteurization should greatly diminish the per cent of frequency of milk borne infections.—M. C. P.

691. *An Investigation of the Shaving Brush Industry, with Special Reference to Anthrax.* Pub. Health Rep., Wash., 1919, 34, 994-996.

The occurrence of facial anthrax among soldiers in the British and recently in the U. S. Army, and among civilians has been traced to the use of infected shaving brushes. Almost all of the shaving brushes used in the United States are made from hair, imported from Russia, China, or Japan. Before the war these products were disinfected in France or Germany, but since 1914 they have been coming direct to the United States via the Pacific route. An investigation of establishments manufacturing brushes revealed various grades of thoroughness in the disinfection of bristles. Some even made no pretense of sterilization.

After a careful survey of the industry and the performance of a few tests under conditions approaching those in manufacturing establishments, it was decided that either boiling or steaming afforded a satisfactory means of treating the hair.

It was found that the temperature in the center of the bundles rose rapidly when boiling or steaming was employed, reaching that of the surrounding water or vapor within a few minutes. A number of shaving brushes were secured in the open market and submitted to bacteriological examination, and some of these were found to be anthrax infected. These, however, could not be traced to any particular manufacturer.—C. E. T.

692. *A Brief Review of Indirect Contact Transmission and a Preliminary Report of Corroborative Laboratory Research.* JAMES G. CUMMING. *Am. J. Pub. Health, Concord*, 1919, 9, 414-417.

In connection with studies of the probable mechanism of influenza transmission through fomites, Cumming presents some preliminary results of laboratory researches. He reports the quantitative findings of *Streptococcus hemolyticus*, the pneumococcus, *B. diphtherias*, *Streptococcus viridans* and *B. tuberculosis* from various sources with which carriers have had contact.—I. S. F.

693. *Influenza-Pneumonia as Influenced by Dish-Washing in Three Hundred and Seventy Public Institutions.* JAMES G. CUMMING. *Am. J. Pub. Health, Concord*, 1919, 9, 849-853.

Presentation, in abstract, of the results of an investigation, chiefly of a statistical nature on the probable spread of influenza-pneumonia through eating utensils.—I. S. F.

## PUBLIC HEALTH REGULATION

(See also Numbers 776, 808)

694. *Preventive Medicine and the War.* MARYCK P. RAVENEL. *Am. J. Pub. Health, Concord*, 1920, 10, 22-23.

The practical elimination of typhoid from the army has been considered one of the greatest triumphs of preventive medicine. Preventive measures for measles and mumps have not met with any marked success. Prevention by protective inoculation has been very successful for pneumonia, with the exception of Type IV. Cerebrospinal meningitis was declared controlled by isolation and by search for carriers. Scarlet fever and diphtheria were not prevalent and were easily controlled. Where preventive measures for influenza were successful it was considered that the men in charge had "played in luck." Diseases borne by insects are particularly susceptible of control.—M. C. P.

695. *An Experimental Study of the Efficacy of Gauze Face Masks.* W. H. KELLOGG. *Am. J. Pub. Health, Concord*, 1920, 10, 34-42.

Gauze masks exercise a certain amount of restraining influence on the number of bacteria laden droplets possible of inhalation. This influence is modified by the numbers of layers of fineness of mesh of the gauze. When a sufficient degree of density in the mask is used, breathing is difficult and leakage takes place around the edges of the mask. This leakage and the forcible aspiration of droplet laden air through the mask is sufficient to make the possible reduction in amount of infection not more than 50 per cent effective. Masks have not been demonstrated to have a degree of efficiency that would warrant their compulsory application for the checking of epidemics.—M. C. P.

696. *The Dust Hazard in the Abrasive Industry.* C.-E. A. WINSLOW, LEONARD GREENBURG AND DAVID GREENBERG. *Pub. Health Rep., Wash.*, 1919, 34, 1171-1187.

Statistics gathered by the United States Census Bureau for 1908 and 1909 and by the Prudential Insurance Company of New Jersey show that exposure to mineral and metallic dusts, as among brass workers, marble and stone cutters and polishers, is accompanied by tuberculosis ratios at least one-third greater than the ratio for all occupied males, and at some age periods more than twice as great. Statistical analyses and special intensive and experimental studies have shown that the most hazardous of the dusty trades are those in which the workers are exposed to the inhalation of small, sharp, nonabsorptive particles. Among the various types of workers liable to industrial tuberculosis, grinders and other users of abrasive materials are recognized as among the worst sufferers. It has been found that establishments devoted to the manufacture of abrasive materials may present conditions in regard to arial dust content that can scarcely be equalled in any other industry. The inorganic fraction of the dust in the air of the abrasive factories studied by the writers includes at least coke, crude aluminum hydroxide, a fused aluminum compound (aloxite or alundum) and carborundum.—C. E. T.

697. *Venereal Disease Control: Methods, Obstacles and Results.* C. C. PIERCE. *Am. J. Pub. Health, Concord*, 1920, 10, 132-137.

Cooperation between various state boards of health and the Public Health Service for the prevention and control of venereal diseases is in actual operation. All obstacles could be removed if sufficient funds were available. At present there is an increasingly large organization of business and social agencies interested in operating with health authorities for the elimination of venereal diseases.—M. C. P.

698. *New Specifications for Health Officers.* MORRIS KNOWLES AND MAURICE R. SCHARFF. *Am. J. Pub. Health, Concord*, 1920, 10, 8-13.

The new specifications require that such-officers be qualified, trained, and experienced in sanitation, public health, and public health administration. A medical degree is not a satisfactory substitute for these requirements, but is desirable. The cause of public health would be advanced if this new specification were incorporated in national, state, and municipal laws relating to the appointment of public health executives.—M. C. P.



699. *Sanitation in Serbia*. EDWARD STEWART. Am. J. Pub. Health, Concord, 1920, 10, 124-131.

A description of the conditions in Serbia during the war is given. Methods adopted by the Allies and by the Austrians to combat disease are detailed.—M. C. P.

700. *The Significance of Some General Biologic Principles in Public Health Problems*. RAYMOND PEARL. J. Am. M. Ass., Chicago, 1920, 74, 375.

Statistics show that we are far from having attained that degree of knowledge of the causal factors in the incidence of morbidity and mortality which makes possible effective control. Intensive investigation of fundamental biologic factors in public health problems are essential to further progress. In a study of the influenza epidemic of 1918-1919, geographic location, age constitution of the population, density of population and rapidity of growth of population had no influence on the course of the epidemic. Restrictive and repressive measures did not have the slightest influence on the course or the severity of the mortality. Explosiveness of influenza epidemic mortality was correlated to a high degree with the three great causes of death, tuberculosis, organic heart trouble, and acute nephritis and Bright's disease. Explosive influenza epidemic mortality was slightly or not at all correlated with the normal death rate from infectious disease, pneumonia, endemic influenza and typhoid fever. Populations particularly subject to constitutional diseases (organic heart disease, acute and chronic nephritis) were least able to withstand the onslaught of an especially virulent epidemic. The great problems of public health must be solved by due consideration of facts regarding the inheritance of such important diseases as phthisis, pneumonia, and heart and kidney disease.—P. G. H.

701. *Principles of Prevention*. Editorial. Am. J. Pub. Health, Concord, 1920, 10, 167-168.

From the standpoint of health department activities and expenditures the communicable diseases may be placed in two groups: those the control of which depends mainly upon education and community effort, and those where preventive measures depend upon education and individual effort. In either case education is the foundation for all preventive measures.—M. C. P.

702. *Economics of Health Administration*. HENRY B. HEMENWAY. Am. J. Pub. Health, Concord, 1920, 10, 105-112.

A comparison of the public health appropriation with public health loss for Illinois for the fiscal year ending June 30, 1918; and a discussion of the methods used.—M. C. P.

703. *The State Department of Health and the Child Welfare Problem of the South*. EDGAR A. HINES. South. M. J., Birmingham, 1920, 13, 98-102.

A plea for active effort by the health departments of the southern states in the direction of child welfare.—J. H. B.

704. *Public Health from a Social Viewpoint*. E. S. BOGARDUS. Month. Bull. Calif. State Bd. Health, 1920, 15, 209-210.

Successful public health work requires the coöperation of 5 different groups of people: (1) Laboratory experts; (2) physicians; (3) social workers; (4) the needy; and (5) the public.—F. W. T.

705. *State Control (Institutional or Otherwise) of Lepers*. W. C. HASSLER. Month. Bull. Calif. State Bd. Health, 1920, 15, 190-192.

In California leprosy is regarded as a state problem and not a county one. This author suggests that lepers be sent to a national leprosarium, their care to be paid for by the state or that the state should establish an institution for them.—F. W. T.

706. *Schools for Health Officers*. F. W. SEARS. Am. J. Pub. Health, Concord, 1920, 10, 155-159.

An account of the course opened at Syracuse, N. Y., for the training of public health officials.—M. C. P.

707. *The Insurance Company in Industrial Hygiene*. Am. J. Pub. Health, Concord, 1920, 10, 160-163.

Life insurance companies, on the whole, have not realized their opportunities in the work for improvement of industrial conditions, but there is an increasing interest shown. According to the old methods, a risk was practically determined by its physical condition, the newer way, selection from the industrial and environmental standpoint, lasts generally through the entire lifetime of the risk.—M. C. P.

## RURAL SANITATION

708. *Role of the Sanitary Privy in the Control of Typhoid Fever*. C. E. SMITH. Am. J. Pub. Health, Concord, 1920, 10, 140-141.

The sanitary privy, if properly constructed, maintained, and operated should do much to control typhoid fever in rural districts.—M. C. P.

709. *Role of the Latrine in Control of Hookworm Disease.* J. A. FERRELL. Am. J. Pub. Health, Concord, 1920, 10, 138-140.

The hookworm problem is two fold: (1) to prevent the soil from becoming infected; and (2) to prevent infected soil from coming in contact with human beings. The problem can be solved if the following procedure is carried out: (1) construct at every home an adequate latrine; (2) educate everyone to the use of the latrines; (3) educate all persons to care for and maintain latrines properly; (4) employ a sufficient number of inspectors to carry on the educational work and when necessary, to use legal measures for the enforcement of sanitary practices.—M. C. P.

### SANITARY ENGINEERING

710. *Swimming Pool Management.* W. P. MASON. Engineer. & Contr., Chicago, 1919, 52, 671.

Continuous circulation with filtration and chlorination proves satisfactory, the optimum temperature is 76° F. A suction sweeper removes fiber. At Troy, alum used was 1 grain per gallon and bleach 0.6 parts per million available Cl. In open air pools the use of CuSO<sub>4</sub> may be required.—L. P.

### DISINFECTION AND GROWTH INHIBITION

711. *Note on the Hygienic Laboratory Method of Standardizing Disinfectants.* Anon. Pub. Health Rep., Wash., 1919, 34, 2297-2298.

A revised method of making broth for disinfectant tests is given. Instead of the somewhat acid beef extract medium, broth is made from finely chopped round steak. After sterilization, it is made neutral, and after 1 per cent of peptone and 0.5 per cent of sodium chloride are added, it is adjusted to pH 7.6.—C. E. T.

712. *Hydrogen Ion Concentration and Antiseptic Potency, with Special Reference to the Action of Acridine Compounds.* C. H. BROWNING, F. GULBRANSEN AND E. L. KENNAWAY. J. Path. & Bacteriol., 1919, 23, 106.

By decreasing hydrogen ion concentration (increase of pH) the antiseptic action in peptone water of diamino-acridine methyl chloride is increased, so that for pH 4, 1-4000 concentration of the antiseptic permits vigorous growth of *B. coli*; and 1-2000 produces sterility in 24 to 48 hours, while for pH 11, 1-400,000 allows vigorous growth and 1-200,000 produces sterility in 24 to 48 hours. HgCl<sub>2</sub> on the other hand suffers a decrease in antiseptic activity with increase of pH.

The authors conclude that the effectiveness of acridine antiseptics in serum is ascribable to two main factors: (1) pH of serum, and (2) lack of chemical or physical combination between acridine and serum constituents. In ox serum heated for  $\frac{1}{2}$  to 1 hour at 55°C., the antiseptic action is increased more than when phosphates alone are added to such serum, the alkali phosphates being used as regulators of pH. Alkali phosphates seem more effective than NaOH in enhancing antiseptic action.—W. C. M.

713. *A Critical Study of Some Methods Proposed for the Liberation of Formaldehyde Gas for Fumigation Purposes.* EDMUND K. KLINE. Am. J. Pub. Health, Concord, 1919, 9, 859-865.

Comparative tests were made of the efficacy of permanganate, dichromate and of bleaching powder in liberating formaldehyde gas from its aqueous solution. Chemical determinations showed the following percentages of the total gas in solution to be liberated by the various methods studied:

Permanganate.....	60-62 per cent
Dichromate.....	29-31 per cent
Bleaching powder.....	25-26 per cent

When bleaching powder was used about 2.3 per cent of the total gas liberated in the course of the reaction was found to be chlorine. In rooms in which the efficiency of fumigation was tested it was found that the gas liberated by means of the bleaching powder had strongly corrosive action on exposed metals and was very injurious to delicate fabrics, destroying both color and texture. Gas liberated by dichromate, although giving a greater concentration of formaldehyde did not show this highly corrosive action. The chlorine was therefore considered to blame, and the method involving the use of the hypochlorite was recommended only when possibility of injury to articles in the room would not be objectionable. Bacteriological control tests showed all of the methods used to be efficient for fumigation purposes, with well known limitations as to heat and moisture.

The proper charge for 1000 cubic feet is:

Sodium dichromate.....	20 ounces
Formalin.....	32 fluid ounces
Sulphuric acid.....	3 fluid ounces
Glycerine.....	3 fluid ounces

—I. S. F.

714. *A Practical Hot-Air Disinfector*. H. ORR. Parasitology, Cambridge, 1919, 11, 267-278.

Believing that dry heat properly applied would have many advantages over the use of steam or sulphur dioxide for delousing, and that it must eventually supersede them for practical purposes on a large scale in armies, the author devised several types of disinfectors. Details are presented of the one now in use throughout the British Expeditionary Force. It may be constructed in a few days time from material readily available in reserve equipment dumps in the forward areas.

Using this disinfector it was found that in fair weather when the clothing is dry, a temperature (55°C.) sufficient to kill lice and nits in 10 minutes is invariably attained beneath the folds of the clothing in from 1 to 5 minutes.

In stormy weather, when the clothing is wet and cold, this lethal temperature is invariably attained in from 5 to 15 minutes.

The temperature beneath the folds of the clothing lags from 10 to 15°C. below that of the surrounding air as registered by the right angle elbow thermometer built in the wall of the disinfector.

It has not been demonstrated that any article of clothing is any way damaged by this process.—W. A. R.

715. *The Effect of Weak Acetic Acid on Spirochaeta pallida*. HERMAN GOODMAN. J. Am. M. Ass., Chicago, 1920, 74, 803.

The author believes that *Spirochaeta pallida* is unable to live in an acid environment as low as 0.5 per cent acetic acid. Such a weak acetic acid solution may therefore be of prophylactic use. As this solution is not poisonous its use may be of considerable advantage.—P. G. H.

716. *The Sterilization of Oils by Means of Ultra Violet Rays*. LAWRENCE T. FAIRHALL AND PAUL M. BATES. J. Bact., Balt., 1920, 5, 49-66.

Ultra violet rays are effective in sterilizing certain oils such as olive, cotton seed (Wesson oil) and almond oils with short periods of exposure. Vegetative forms, spores of bacteria, certain molds and lipolytic enzymes normally found in oil are sensitive to the rays. The chemical changes effected in the oil by the rays during such short exposures as are biologically effective are inappreciable. These results are significant and important practically in the technic of sterilizing oils for lipovaccines.—I. S. F.

717. *Ueber ein neues wasserlösliches Kresolpräparat "Fawestol."* (A New Water-Soluble Cresol Preparation, "Fawestol.") FRITZ DITTHORN. Centralbl. f. Bakteriologie (etc.), Jena. I. Abt., Orig., 1918, 80, 374-380.

Fawestol is a water soluble cresol with the same cresol content as crude cresol. It forms clear solutions up to 2.25 per cent.

One per cent solution will kill dried vegetative bacteria in one minute but is not reliable for anthrax spores even in 2 per cent solution. A 2 per cent solution is considered reliable for disinfecting an equal volume of stools.—M. L.

718. *Einwirkung verschiedener Desinfektionsmittel auf Metalle*. (Action of Various Disinfectants on Metal.) H. WILL AND FRANZ O. LANDTBLOM. Ztschr. f. d. ges. Brauwesen, Munich, 1919, 42, 81-82.

The actions of hydrofluoric acid, flammol, montanin and formalin were tested on zinc, aluminium, steel, iron and copper. Formalin, because of its chemical nature, does not itself directly attack metals. It is active only in the presence of its transformation product, formic acid. A table is given in which the amount of metal dissolved from standard pieces of metal when acted upon by various strengths of the disinfectant is reported. The weight of the metal pieces before and after exposure, and the number of grams of metal lost per hour per square meter of surface are calculated.—R. E. B.

719. *Ueber die Desinfektionswirkung von Cyanwasserstoff*. (The Disinfecting Action of Hydrocyanic Acid.) EMIL V. SKRAMLIK. Centralbl. f. Bakteriologie (etc.), Jena. I. Abt., Orig., 1919, 83, 386-391.

Slant agar cultures of the organism *Vibrio cholerae*, Shiga-Kruse bacillus, staphylococci, and paratyphoid B, fowl cholera, Flexner and Y bacilli were exposed to hydrocyanic acid gas for 24 hours. The asiatic cholera, Shiga-Kruse, dysentery and fowl cholera organisms were killed, and there was some inhibition of growth with staphylococci, Flexner and Y bacilli. Evidently hydrocyanic acid is not particularly destructive to microorganisms. Studies were also made with yeast and air bacteria dried on filter paper. In general, yeasts were destroyed while the number of bacteria of air types was materially reduced.—R. E. B.

## WATER AND SEWAGE BACTERIOLOGY

720. *Final Report of the Committee on Sanitary Drinking Fountains of the Iowa Section of the American Water Works Association.* J. H. DUNLAP, J. J. HINMAN AND DALE MAFFITT. J. Am. Water Works, Ass., N. Y., 1920, 7, 33-40.

The following conclusions were reached: (1) All types of drinking fountains with vertical jets are to be condemned; (2) most types of drinking fountains with slanting jets are to be condemned; (3) to be sanitary, drinking fountains should conform to the following requirements: (a) the jets shall be slanting; (b) the orifices of the jets shall be protected in such a manner that they cannot be touched by hands, lips, droppings from the mouth, etc.; (c) the guards of the orifices shall be so made that infectious material from the mouth cannot be deposited on them; (d) all fountains shall be so designed that proper use is self evident.—F. W. T.

721. *The Presence of Fecal and Non-Fecal Types of the Colon Bacillus in Various Types of Water.* WILLIAM ROYAL STOKES. Am. J. Pub. Health, Concord, 1919, 9, 571-574.

The author presents a very brief review of the recent literature on the occurrence of the fecal and non-fecal types of the colon bacillus in water and gives the results of further studies on the correlation between type and source of isolation or pollution. More than half of the members of the colon-aerogenes group isolated from water, about 44 per cent of those isolated from milk and about 43 per cent of those from oysters belonged to the high gas-ratio group (*B. aerogenes* group). In sewage the high ratio group was present in 38.7 per cent of the samples; in feces (human and bovine) and in urines, in only 1.6 per cent; in cereals, 26.18 per cent and in the various grains 85.4 per cent. None but low gas-ratio types (*B. coli*) were isolated from human stools. Filtered and treated waters contain a somewhat higher percentage of low ratio organisms than raw water. Only one low ratio organism was found in 14 samples of artesian wells containing members of the colon-aerogenes group. Twelve contained high ratio organisms and one the *B. cloacae* type. Stokes concludes: "A study of the sources of the various types shows that the one known as the high ratio is constantly present on grains and cereals and only occasionally found in stools and urines. On the other hand, the low ratio type is constantly present in stools and urines but is rarely found on grains and cereals. The *B. cloacae* type is less frequently found, and is obtained from both these sources in about equal proportions. It therefore seems that grains may be regarded as the principal source of the high ratio type and stools and urines of the low ratio type."—I. S. F.

722. *Characteristics of the Colon Type of Bacteria Found in Feces.* CHESTER A. DARLING. Am. J. Pub. Health, Concord, 1919, 9, 844-848.

One hundred and thirteen coli-like cultures were isolated in nearly equal numbers from the feces of man, horse, sheep, rabbit and chick. The isolations were made by aseptic collection, dilution in sterile water, and plating on litmus lactose agar. "From the incubated plates coli-like colonies which showed acid production were selected and from them streak cultures were made onto plain nutrient agar. In the selection of the cultures for study only short, rod-like organisms which fermented lactose with production of acid and gas were chosen." Tests for motility, spore formation, capsule formation in milk, liquefaction of gelatin, reaction to Gram's stain, production of indol, reduction of nitrates, reaction in milk, methyl red and Voges-Proskauer tests, fermentation of dextrose, lactose, saccharose, inulin, mannit, and salicin, and diastatic action on potato starch were made. None of the 113 organisms were found to be of the *B. aerogenes* type (by methyl red and Voges-Proskauer). Tests for motility, capsule formation in milk, coagulation of casein, fermentation of saccharose, and fermentation of salicin showed considerable variation for the organisms from different sources. None of the organisms from the feces of man or horse gave positive capsule formation, while those from the feces of sheep, rabbit and chick gave 95-100 per cent positives. This suggests a distinguishing characteristic. Coagulation of casein studies gave somewhat suggestive results as a character for differentiation.—I. S. F.

723. *Disinfection of Sewage.* C. G. WIBLEY. Munic. J., Balt., 47, 292-293.

Detail results obtained at Millville and Camp Merritt with liquid chlorine. Bacterial analyses are given. At Millville shell fish beds were protected.—L. P.

724. *Description of an Apparatus for Obtaining Samples of Water at Different Depths for Bacteriological Analysis.* FRANK C. WILSON. J. Bact., Balt., 1920, 5, 103-108.

Description of a bacteriological water sampler for drawing samples at different levels. An exhausted tube is mounted on a metal frame and the whole lowered and operated by a single line. The entire apparatus is not difficult to build.—I. S. F.

725. *Pollution of Deep Wells at Lansing, Michigan.* EDWARD D. RICH. Am. J. Pub. Health, Concord, 1920, 10, 147-151.

Early in March, 1919, the rapid rise of the Grand River was responsible for highly polluted ground water gaining entrance to the city supply of Lansing, Mich. A serious epidemic of dysentery, accompanied by some typhoid fever, followed. Emergency chlorinating apparatus was installed and after repeated analyses were made, two of the old wells were or-

dered permanently disconnected and plugged. All pumping stations, except one, now have chlorinating machines.

With deep wells there are three avenues by which dangerous pollution may suddenly gain access: (1) deterioration in joints and piping; (2) pumping in excess of the normal capacity of the wells tends to open texture of the rock; in case of sandstone and to enlarge any fissures already present; (3) careless abandonment of old wells penetrating the same water-bearing stratum.—M. C. P.

**726. *The Operation of Water Purification Plants in Ohio.*** W. H. DITTOE. Ohio Pub. Health J., Columbus, 1920, 11, 13-24.

Dittoe reviews the water supply situation for Ohio and outlines the needs of every water supply treatment plant. The rapid sand filter plants in Ohio are listed in tabular form with their nominal capacity, date of installation, how supervised, periodicity of analysis, etc. Monthly reports are made to the State Department of Health on blanks which are reproduced at the end of the paper.—F. W. T.

**727. *Water Pollution at Auburn, New York, Decided to be a Violation of the State Penal Code.*** J. W. ACKERMAN. J. Am. Water Works Ass., N. Y., 1920, 7, 41-43.

The Auburn Water Board instituted proceedings against the Trustees of the Village High School of Moravia to enjoin them from polluting Owaseo Lake from which the water for use in Auburn is drawn. The plaintiff was given damages of \$500 and the sheriff of the County of Cayuga was instructed to see that further nuisance was stopped.—F. W. T.

**728. *The Water Supply System of Camp McClellan, Alabama.*** M. R. SHARFF. J. Am. Water Works Ass., N. Y., 1920, 7, 108-116.

The complete water supply system is described.—F. W. T.

**729. *The Water Supply Problem in a Combat Division.*** L. A. FRITZE. J. Am. Water Works Ass., N. Y., 1920, 7, 117-126.

The author served as Water Supply Officer for the Rainbow Division and later was Water Supply Officer for the Third Army. An interesting account of his duties is presented which does not lend itself to abstracting.—F. W. T.

**730. *Water Consumption in Army Camps.*** G. A. JOHNSON. J. Am. Water Works Ass., N. Y., 1920, 7, 102-107.

The designs for these water systems were based on a daily per capita consumption of water of 55 gallons. Data supplied by Johnson indicate that this was reasonable.—F. W. T.

**731. *Legal Responsibility for a Pure Water Supply.*** J. WILSON. J. Am. Water Works Ass., N. Y., 1920, 7, 44-51.

A general discussion of the subject.—F. W. T.

**732. *Pollution of Niagara River by Wash Water from Filtration Plant Enjoined.*** ANON. J. Am. Water Works Ass., N. Y., 1920, 7, 52-59.

The defendants were given 6 months to find another outlet for disposing of water used for washing filters. This discussion is supported by numerous court decisions.—F. W. T.

**733. *Ozone as a Disinfectant in Water Purification.*** J. W. ELLMS. J. Am. Water Works Ass., N. Y., 1920, 7, 60-64; Municip. County Engineer, Indianapolis, 1919, 57, 186-188.

A brief history of ozone and its manufacture. The paper is simply a short general discussion; no experimental data are presented.—F. W. T.

**734. *Crenothrix Removal by Chlorine.*** W. F. MONFORT. Municip. J., Balt., 1919, 47, 223.

The use of 4.5 pounds liquid chlorine per million gallons before filtration is very effective in aiding removal of Fe and crenothrix. Crenothrix requires organic matter for growth, not Fe or CO<sub>2</sub>. Tests at Urbana are detailed.—L. P.

**735. *The Outdoor Pool.*** CHARLES V. CRASTER. Am. J. Pub. Health, Concord, 1919, 9, 823-826.

The author made total counts of bacteria and determination of fermenting organisms in three drawing pools. All showed high contamination. When contamination cannot be otherwise controlled, the author recommends routine chlorination.—I. S. F.

## FOOD BACTERIOLOGY

**736. *Uses, Possibilities and Limitations of Bacteriology in Food Control.*** E. O. JORDAN. Am. J. Pub. Health, Concord, 1920, 10, 142-146.

It seems probable that increasing emphasis will be laid on bacterial methods as an aid to the interpretation of the sanitary inspection of food stuffs and as a guide to satisfactory sanitary procedure. Continued laboratory investigation of the two best known instances of so-called "food poisoning" seems called for since both are intimately connected with problems of food conservation. The nature and sanitary significance of the products generated by bacteria, particularly the saprophylic bacteria, are practically unknown.—M. C. P.

757. *Food Inspection and Food in Relation to Public Health.* G. KOEHLER. Am. J. Pub. Health, Concord, 1919, 9, 418-426.

In a discussion of certain public health phases of food inspection, the author presents some interesting data on the effect of pasteurization of milk upon the typhoid death rate and the infant mortality rate of Chicago during the years 1907-1918. He also presents data on milk and food borne epidemics which have occurred in Chicago in this same period.—I. S. F.

758. *Nature of the Toxic Agent in "Meat Poisoning."* ISIDOR GREENWALD. Am. J. Pub. Health, Concord, 1919, 9, 595-598.

The toxin of *B. botulinus* is thermolabile and probably is not produced in the intestine. There is some evidence pointing to the thermo-stability of certain toxins elaborated by organisms of the paratyphoid group. A series of experiments is reported on the feeding of rats, mice and guinea pigs on a diet containing meat variously infected with *B. enteritidis*, *B. putrificus*, *B. fecalis alkaligenes*, *B. proteus*, *B. paratyphoid* B and *B. botulinus*. Five samples of meat "likely to give rise to 'meat poisoning' were obtained from a slaughter house" and fed to animals. Before feeding, the meat had been heated in a water bath kept boiling for 30 minutes. In no case was there any evidence of the presence of a thermo-stable toxin in the meats. Possible thermo-labile toxins should be further investigated.—I. S. F.

759. *Botulism from Eating Canned Ripe Olives.* CHAS. ARMSTRONG, R. V. STORY AND ERNEST SCOTT. Pub. Health Rep., Wash., 1919, 34, 2877-2905.

Fourteen cases of botulism occurred at Canton, Ohio, among 17 persons who ate ripe olives. Seven of these were fatal. The severity of the illness was proportionate, in general, to the number of ripe olives eaten.

One cc. doses of an emulsion of one-half an olive in 10 cc. of sterile saline given subcutaneously proved lethal to guinea pigs, and 0.5 cc. gave symptoms but recovery. The brine proved fatal in 0.001 cc. doses. An uncertain amount of one olive was fatal to a guinea pig by mouth as well as 0.15 cc. of brine. The brine was found to contain a soluble toxin which was fatal in subcutaneous doses. After heating to 80°C. for 30 minutes, however, it proved harmless. A medium made of chopped olives covered with brine and sterilized was found to be a favorable medium for growth and toxin production. The organism was found to grow on a medium containing as much as 6 per cent sodium chloride. Anaerobic conditions seem to be necessary for growth. Cultures have been found to resist heating to 100°C. for 30 minutes in the Arnold sterilizer. Cultures heated for longer periods at 100°C. or autoclaved at 15 pounds for 15 minutes were killed. A strong toxin was produced in 9 days, being lethal for guinea pigs in 0.00005 cc. doses.

Since two cases which recovered had partaken of alcoholic drinks during the evening, 95 per cent of alcohol was injected with the toxin. It was found that guinea pigs could thus be protected against 20 lethal doses of toxin. Antitoxin and agglutinins could not be demonstrated in the blood of recovering patients 45 days after the dinner. Serological tests have not been successful in identifying the organism nor has free toxin been demonstrated in the blood of patients. The organisms may be freed from toxin by heating to 80°C. for 30 minutes, after which they are non-lethal for guinea pigs. They are more difficult to free from toxin by washing. From the fact that some of the people who ate small amounts of the olives recovered, it would look as if the organism did not produce toxin in the alimentary canal. There are no available records of the successful use of antitoxin except in animals. One cc. of antitoxin prepared against the Boisé strain by the Bureau of Animal Industry, United States Department of Agriculture, was found to protect guinea pigs against four thousand lethal doses of toxin formed by the olive organisms.—C. E. T.

740. *An Outbreak of Botulism.* DWIGHT L. SISCO. J. Am. M. Ass., Chicago, 1920, 74, 516.

The outbreak reported occurred in an Italian family, living in the Bronx, New York City. A glass jar of California ripe olives was the source of the poison. The *Bacillus botulinus* was found and a filtrate through a filter candle caused the death of a white mouse in 72 hours when a dose of 0.004 cc. was given. The toxin was destroyed by heating at 80°C. for 2 minutes. Six of the seven members of the family died. The olives were giant size California ripe olives and were packed in 14-ounce glass, hermetically sealed jars. The olives were rejected by the purchasing house because they were not of good quality. They were resold by the California company. Statements as to the condition of the olives could not be obtained, because the patients were too far gone when the investigation began.—P. G. H.

741. *Botulism. Preliminary Report of a Study of the Antitoxin of Bacillus botulinus.* ERNEST C. DICKSON AND BEATRICE M. HOWITT. J. Am. M. Ass., Chicago, 1920, 74, 718.

A potent antitoxin to the poison of *B. botulinus* was obtained from three goats treated with 3 different strains of *B. botulinus*. It was shown that there are at least 2 types of *B. botulinus* and that an antitoxin prepared by the use of one type does not protect against poisoning with the other. The therapeutic value of antitoxin against botulism poisoning has not been established, but since there are at least two types and since it is impossible to ascertain which is the cause of poisoning the authors advise the preparation of a polyvalent antitoxin, by the use of which favorable results may be obtained. The antitoxin is given intra-

venously. As it is necessary to give large doses a preliminary test for hypersensitiveness should be made. The antitoxin is injected slowly, at the rate of not more than 1 cc. a minute. When hypersensitiveness is shown, preliminary subcutaneous, intramuscular and intravenous injections of 1 cc. at one hour intervals should be given and one hour after the last injection the full amount should be injected intravenously at the rate of not more than 1 cc. a minute.—P. G. H.

742. *The Occurrence of Bacillus botulinus in Nature.* G. S. BURKE. J. Bact., Balt., 1919, 4, 541-553.

Two hundred and thirty-five cultures were made from a great variety of sources in 5 localities in central California. Seven cultures were positive for *B. botulinus* by toxin test. These were isolated from cherries, bean leaf, spiders, bush beans, (packed for canning), manure from hog, and moldy hay. Four other cultures possibly of *B. botulinus* were met with. The results indicate the wide distribution of the organism in nature. It is present in gardens and may appear on fruits and vegetables which are not necessarily decayed. It may remain for months in the intestine of the hog after ingestion of infected food.—I. S. F.

743. *Notes on Bacillus botulinus.* G. S. BURKE. J. Bact., Balt., 1919, 4, 555-571.

From serological reactions it appears that there are two types of *B. botulinus*, designated A and B, which produce heterologous toxins. The most reliable method of demonstrating the presence of *B. botulinus* in suspected material consists in the cultivation in Van Ermenegem broth or in meat cultures and in testing the filtrates of the cultures for toxin by guinea pig inoculation. By this method the organism can sometimes be recovered from material in which the presence of toxin cannot be demonstrated by direct animal inoculation. The colonies on agar are characteristic and hence may be easily recognized and isolated in agar shake cultures. Growth and toxin production are both readily accomplished at 28°C. and at 37.5°C. *B. botulinus* does not produce a heavy sediment in broth and does not produce spores readily in either broth or agar.—I. S. F.

## HEALTH BOARD LABORATORY METHODS

(See also Numbers 506, 551)

744. *A Few Facts to Remember in the Interpretation of Bacteriological Findings.* PHILIP CASTLEMAN AND KARL R. BAILEY. Am. J. Pub. Health, Concord, 1919, 9, 602-605.

An outline to aid health officers and laboratory workers in the interpretation of laboratory findings in diphtheria, typhoid, malaria, tuberculosis, gonorrhoea and gonorrhoeal ophthalmia, syphilis, pneumococcus type determination, rabies, and milk.—I. S. F.

745. *The Value of Presumptive Tests for Bacillus coli Based on the Routine Use of Lactose Bile and Lactose Broth.* NEVA RITTER. J. Bact., Balt., 1919, 4, 609-614.

Report of the results obtained from the examination of 1899 samples of tap water showing fermentation in bile, or broth or both, from 46 city surface supplies in Kansas, July, 1918 to May, 1919. The results are summarized by the author thus:

"1. If there is fermentation in both bile and broth tubes, the presumptive test is reliable in 75.05 per cent of all cases considered.

"2. If all three broth tubes, as well as the bile, are positive, a greater percentage of tests are confirmed as *B. coli* than is the case when only one or two tubes out of three are positive.

"3. When broth alone is positive the water in 70 per cent to 78 per cent of cases is proved not to contain *B. coli*.

"4. Samples with both media positive in twenty-four hours contain *B. coli* in 97.67 per cent of cases and therefore do not need confirmation."—I. S. F.

746. *Ueber den Zusammenhang des Paratyphus der Tiere mit dem Paratyphus des Menschen. (The Relation Between Paratyphoid Fever of Animals and Man.)* MAX MÜLLER. Centralbl. f. Bakteriologie (etc.), Jena. I. Abt., Orig., 1918, 80, 413-449.

A detailed discussion of several food poisoning outbreaks in which *B. paratyphosus* B was isolated from infected calves. Boiling meat is regarded as insufficient to destroy the infective agent. Mice fed on meat, which had been previously inoculated with *B. paratyphosus* B and boiled 10 minutes, succumbed to para B septicemia.—M. L.

747. *Ein Erneuerungsverfahren für gebrauchten Metachromgelb-Wasserblau-Dreifarbennährboden. (A Method for Renovating Used Metachrome Yellow-Waterblue Threes Colored Media.)* JOH. ZEISSLER AND G. GASSNER. Centralbl. f. Bakteriologie (etc.), Jena. I. Abt., Orig., 1918, 80, 253-258.

Method for re-utilizing the medium which was employed for typhoid dysentery isolation is described.—M. L.

748. *The Thick Blood Film Method for Malaria Diagnosis Applicable to Present Field Conditions.* BRUCE NAYNE. Pub. Health Rep., Wash., 1919, 34, 837-842.

The article gives a detailed technic for staining blood for malarial parasites. It has been found that the method of dragging the blood sharply on the slide has several advantages over the method of puddling the blood with a circular movement of needle or slide.—C. E. T.

749. *Some Limitations of the Flotation Method of Fecal Examination.* J. DULEY McDONALD. J. Lab. & Clin. M., St. Louis, 1920, 6, 386-391.

The experiments performed by the author show that the range of application of this method is limited by the type of ovum; infections with *Clonorchis* and *Fasciola* are not revealed by it and its effectiveness in the detection of any operculate ova is doubtful.—F. W. H.

## DIATHETIC AND DEFICIENCY DISEASES

750. *Experimental Mammalian Polyneuritis Produced by a Deficient Diet.* CARL VOEGTLIN AND G. C. LAKE. Pub. Health Rep., Wash., 1919, 34, 3-4.

It has been shown that beri-beri is due to a deficiency of the diet in a definite substance (antineuritic vitamins), which is essential for normal nutrition. Experiments were made on the nutritive value of meat, influenced by exposure to higher temperatures, with the following results: (1) Polyneuritis was produced in cats and dogs as the result of an exclusive dietary of lean beef which was heated for 3 hours at 120°C. in the presence of alkali (sodium carbonate); (2) the specific symptoms and pathology of deficiency polyneuritis developed, including loss of weight, paralysis, and histopathological changes in the nervous system; (3) the disease is due to a deficiency of the diet in antineuritic substance; (4) exposure of the beef for 3 hours to a temperature of 120°C. without the previous addition of alkali does not completely destroy the antineuritic power of this food; (5) cats are best adapted for physiological studies of the function of the antineuritic substance.—C. E. T.

751. *Le scorbut expérimentale du cobaye est-il dû à la constipation? (Is Experimental Scurvy in the Guinea Pig Due to Constipation?)* G. MOURIQUAND AND P. MICHEL. Compt. rend. Soc. de biol., Par., 1920, 83, 62.

The authors conclude from experimental data that since neither purgation nor intestinal disinfection will protect guinea pigs from the condition cecal retention and constipation can be excluded as causative factors.—G. H. S.

752. *Biochemical Studies of the Saliva in Pellagra.* M. X. SULLIVAN AND K. K. JONES. Pub. Health Rep., Wash., 1919, 34, 1068-1080.

In true pellagra the tongue is vividly red and more or less swollen. The salivation, which is considered a symptom of pellagra, is seemingly due to some inhibition of swallowing combined with a peculiar ropy change in the saliva. The amount of mucus precipitated from saliva by acetic acid was greater for the saliva of the pellagra patients than for the controls, although the increase is apparently unrelated to the severity of the symptoms. The sulphocyanate content is much less marked in the case of pellagra patients than it is in the saliva of normal people, indicating, it is believed, a lessened protein intake and a detoxicating power feebler than normal. The reaction is somewhat more alkaline than that of normal saliva.—C. E. T.

753. *The Treatment of Hay Fever.* WM. SHEPPEGRELL. Pub. Health Rep., Wash., 1919, 34, 1673-1681.

After discussing the part played in hay fever by such measures as hygienic precautions, screening, masks, inhalers, diet, surgical operations, constitutional and local treatment, and nasal massage, the author discusses the benefit of pollen and vaccine therapy. Before pollen extracts are used, diagnostic tests should be made by injecting intradermally the pollen to be tested. The principal pollens during the spring are from the grasses and in the fall from the ragweeds. After the degree of sensitization is determined, the treatment is commenced 6 weeks before the spread of the pollen to which the patient is sensitive. The treatment is begun with 5 units and increased to 100 or 200 units, injected 2 or 3 times weekly. As soon as the specific pollen appears in the atmosphere the injections should be reduced to 20 or 30 units.

During the active pollinating season, when attacks of hay fever are severe, the pollen therapy is usually ineffective, and a vaccine containing *B. friedländer*, *M. catarrhalis*, pneumococcus, *Streptococcus pyogenes*, and *Staphylococcus aureus* and *albus* has been used with satisfactory results.

Out of a series of 707 cases, seasonal cures were obtained in 49 per cent of the cases and marked improvement in 40 per cent. In cases of recent origin, one season's treatment is usually sufficient, but in cases of longer standing, 2 or 3 courses are required.—C. E. T.



## CANCER RESEARCH

764. *Kritische Studien zur experimentellen Therapie maligner Neoplasmen: I. Zur Frage der aktiven und passiven Immunisierung und Therapie mit Krebsaft.* (Critical Studies upon the Experimental Therapy of Malignant Neoplasms: The problem of Active and Passive Immunization and Therapy with Tumor Juice.) S. FRÄNKEL AND E. FÜRER. Wien. klin. Wehnschr., 1915, 28, 1433.

Expressed tumor juice has neither therapeutic nor immunizing activity, nor has the serum of animals treated with tumor juice any curative effect.—W. H. W.

765. *Kritische Studien zur experimentellen Therapie maligner Neoplasmen: II. Ueber die Einwirkung artfremder Sera auf Neoplasmen.* (Critical Studies upon the Experimental Therapy of Malignant Neoplasms: II. The Effect of Heterologous Serums upon Neoplasms.) S. FRÄNKEL AND E. FÜRER. Wien. klin. Wehnschr., 1916, 29, 63.

Intravenous administration of relatively large amounts (up to one-twentieth of the body weight) was quite without effect upon mouse tumors.—W. H. W.

766. *Kritische Studien zur experimentellen Therapie maligner Neoplasmen: III. Kritisch-experimentelle Studien zur Chemotherapie des Krebses.* (Critical Studies upon the Experimental Therapy of Malignant Neoplasms: III. Critical Experimental Studies upon the Chemotherapy of Cancer.) S. FRÄNKEL AND E. FÜRER. Wien. klin. Wehnschr., 1916, 29, 96.

Cholin and related substances exert no effect on mouse carcinoma and sarcoma.—W. H. W.

767. *Kritische Studien zur experimentellen Therapie maligner Neoplasmen: IV. Weitere kritisch-experimentelle Studien zur Chemotherapie des Krebses.* (Critical Studies upon the Experimental Therapy of Malignant Neoplasms: IV. Further Critical Experimental Studies upon the Chemotherapy of Cancer.) S. FRÄNKEL AND E. FÜRER. Wien. klin. Wehnschr., 1916, 29, 198.

Various substances were all without effect upon mouse carcinoma, sarcoma, and chondroma.—W. H. W.

768. *Kritische Studien zur experimentellen Therapie maligner Neoplasmen: VII. Ueber die angebliche Immunität röntgenbestrahlter Tiere.* (Critical Studies upon the Experimental Therapy of Malignant Neoplasms: VII. The Apparent Immunity of Röntgenized Animals.) S. FRÄNKEL AND E. FÜRER. Wien. klin. Wehnschr., 1916, 29, 821.

The indirect effect of hard rays exerted upon the tumor, via the host, according to Frankl and Kimball (Wien. klin. Wehnschr., 1914, 27, 1448) could not be substantiated.—W. H. W.

769. *Kritische Studien zur experimentellen Therapie maligner Neoplasmen: VIII. Ueber die Einwirkung verschiedener Ernährung auf Neoplasmen.* (Critical Studies upon the Experimental Therapy of Malignant Neoplasms: VIII. The Effect of Various Diets upon Neoplasms.) S. FRÄNKEL, B. BIENEFELD AND E. FÜRER. Wien. klin. Wehnschr., 1917, 30, 1131.

There is no difference in the growth of tumors in mice fed with fat and protein, or with carbohydrates, or with an ordinary laboratory diet.—W. H. W.

770. *Studien über das Krebsproblem: I. Ueber Veränderungen der Katalasewirkung.* (Studies upon the Cancer Problem: I. Changes in Catalytic Activity.) S. WIENFELD. Wien. klin. Wehnschr., 1918, 31, 324.

Catalase was selected for investigation, in preference to any other endocellular ferment, because its amount can be easily measured by the decomposition of hydrogen peroxide. An attack on the cell sufficient ultimately to destroy its membrane will set free catalase. Hence, the catalytic activity is increased in necrotic tumors and in tumors frozen or set aside for a time in the ice-box. And it is no higher in radiated tumors than in these.—W. H. W.

771. *Studien über das Krebsproblem: II. Ueber die Wirkung von Fluoreszenzbakterien au Rattensarkom.* (Studies upon the Cancer Problem: II. The Effect of the Fluorescent Bacteria upon Rat Sarcoma.) S. WEIDENFELD AND E. FÜRER. Wien. klin. Wehnschr., 1918, 31, 437.

Intravenous injection of a large dose of a virulent culture of *Bacterium fluorescens liquefaciens* (Basel-Würzburg) was followed by total necrosis of a rat sarcoma (Lewin) in many of the animals. When increasing doses were given, the effect upon the tumors was especially distinct, and the mortality among the rats was much lower. But it was just those animals in which tumors retrogressed that died. Heating the bacterial emulsion destroyed its action. The authors carefully differentiate this recession from the spontaneous absorption so common in transplantable sarcoma.—W. H. W.

772. *Ueber die Heilbarkeit der Krebskrankheit.* (The Curability of Cancer.) A. FRAENKEL. Wien. klin. Wehnschr., 1919, 32, 1110.

Critical review of the problem.—W. H. W.

## DISEASES OF THE CIRCULATORY SYSTEM

763. *Studies on Rocky Mountain Spotted Fever.* S. BURT WOLBACH. J. Med. Research, Boston, 1919, 41, 1-197.

In this report are given in detail the protocols upon which the conclusions in regard to etiology are based; the pathology of the disease is described. A comprehensive review of all subjects relating to Rocky Mountain spotted fever is included.

The lesions of the blood vessels are due to the presence of the parasite and constitute the distinctive pathology of the disease, and warrant the definition—"An acute specific infectious endangiitis, chiefly of the peripheral blood vessels." The lesions are at first essentially proliferative (endothelium), followed by necrosis of small groups of cells, and the chief cellular reaction, both locally in response to the presence of the parasite, and in general, presumably in response to toxins, is endothelial.

Three definite morphological types of the spotted fever parasite can be recognized: (1) An extra-nuclear bacillus-like form without chromatoid granules, relatively large and only present in ticks during the initial multiplication of the parasites; (2) a relatively small rod-shaped form with chromatoid granules, probably the same form seen within nuclei in sections of ticks, and rarely in smooth muscle cells in the blood vessels of mammals; and (3) a relatively large lanceolate paired form present in ticks and in the blood and lesions of mammals.

The reasons for concluding that the parasite of Rocky Mountain spotted fever is not a bacterium, in the ordinary sense of the term are: (1) Its morphological sequence in infected nymphs, and the presence of only one morphological type in the blood of mammals; (2) it is unlike bacteria in its staining reactions, and its contour with the dark field illumination does not present the refractive contour shown by bacteria; (3) its extreme susceptibility to physical and chemical agents; (4) its specificity for the peripheral blood vessels, with the production of an identical type of lesion and disease course in all susceptible animals. There is but a single reason for considering the classification of this organism with bacteria, and that is its bacterium-like morphology. The author is convinced that the organism of Rocky Mountain spotted fever represents a new type of parasite, and proposes the name *Dermacentrozetus rickettsi*.

The following facts led to the conclusion that the microorganism described is the causative agent of Rocky Mountain spotted fever:

(1) The constant occurrence of a microorganism of distinctive size and morphology in the lesions characteristic of the disease in man, monkey, rabbit and guinea pig; (2) the constant presence of an identical microorganism exhibiting undoubted evidences of developmental phases in ticks of proved infectivity, and the absence of similar forms in proved non-infective ticks; (3) the ability to recognize this specific microorganism in the tissues and eggs of infective ticks in the presence of bacteria occasionally present in ticks of the species concerned.

Mammalian "carriers" of the disease have not been discovered. In all experimental animals the blood ceases to be infective after the subsidence of fever. The findings of infective ticks on the mountain goat suggests a much needed line of research. The possibilities of an immune therapy necessarily lie in the discovery of a large sized susceptible animal.

An extensive bibliography is appended, and the paper is illustrated by 21 plates.—A. C. E.

764. *Syphilitic Heart Disease.* C. M. GRIGSBY. Texas State J. M., Fort Worth, 1920, 15, 368.

A brief general statement of those cardiac changes which may result from syphilitic infection.—J. H. B.

## DISEASES OF THE DIGESTIVE SYSTEM

(See also Numbers 602, 844)

765. *Die Infektion der Gallenblase bei Typhus und Paratyphus und ihr Nachweis durch die Duodenalsondierung.* (Infection of the Gall Bladder in Typhoid and Paratyphoid, and its Recognition by Means of Duodenal Sampling.) SCHIEVELBEIN. Centralbl. f. Bakteriöl. (etc.), Jena. I. Abt., Orig., 1919, 83, 97-101.

The author has studied the bacterial content in bile secured from the duodenum in 71 cases of typhoid and paratyphoid fever and in so-called bacillus carriers. Five typhoid carriers were studied. Of these, 3 were free from the organisms at the end of a month as shown by 10 consecutive daily examinations of both stools and bile. In one case the bile showed typhoid bacilli in 100 per cent of these examinations and the feces in about 50 per cent. In two cases of paratyphoid A carriers both stools and bile were constantly positive. In a study of 36 patients affected with paratyphoid B and showing constantly positive stools the bile examination gave positive results in 30 or 84 per cent. It is concluded that while a large proportion of carriers have a chronic gall bladder infection, this is not true of all carriers.—R. E. B.

766. *On the Bacteriology of Dysentery in Norway.* TH. THJØTTA. J. Bact., Balt., 1919, 4, 355-378.

The results reported here are based chiefly upon studies of 65 strains of dysentery bacilli isolated from the stools of patients suffering from typical dysentery or acute diarrhea, all from Bergen, or neighboring towns or rural districts on the west coast of Norway. About 50 of these strains have been studied carefully, serologically, and culturally; the remaining 15 have only been tested and identified. Dysentery bacilli are classified by the author into three groups, termed Groups I, II and III.

Group I. The Shiga type (non-mannit fermenting, toxic type).

Group II. The Flexner, Strong and Y type (mannit fermenting, atoxic type, pseudo-dysentery bacilli, Sonne's Groups I and II).

Group III. Group III of Sonne (the new member of the mannit fermenting types).

The characteristics of organisms of Group II are: Production of rather small colonies, quite like the colonies of *Bact. typhi*; production of acid in maltose and sucrose in fluid media, with variability in these characters with the length of time under cultivation; production of indol; some serological relation to the Group I organisms.

Group III is characterized by: Production of rather large, typical colonies; production of acid in maltose, sucrose and occasionally in lactose; negative for indol production; no serological relationship with organisms of Groups I and II; the tendency to low but characteristic agglutination titers and very fine agglutination floculi; specific complement absorption and bactericidal reactions.—I. S. F.

767. *Caractères différentiels des Bacilles observés au cours de la dysenterie bacillaire.* (Differential Characteristics of Bacilli Noted in the Course of Bacillary Dysentery.) JULIEN DUMAS. Compt. rend. Soc. de biol., Par., 1919, 82, 1346.

A detailed statement of the differential characteristics of four groups of bacilli isolated during a dysentery epidemic. Forty-one of these atypical dysentery strains were isolated and classified into four groups upon the basis of their reactions in carbohydrates, their activity toward neutral red, and their action on lead acetate medium.—G. H. S.

768. *Avirulence et atoxicité des Bacilles observés au cours de la dysenterie bacillaire.* (The Avirulence and Atoxicity of the Bacilli Found in the Course of Bacillary Dysentery.) JULIEN DUMAS. Compt. rend. Soc. de biol., Par., 1919, 82, 1363.

The organisms previously described by the author were found to be without virulence or toxicity when injected into experimental animals.—G. H. S.

769. *A Contribution to the Study of Chronicity in Dysentery Carriers.* W. FLETCHER AND D. L. MACKINNON. Med. Research Committee, Spec. Rep. Series, No. 29, 1919.

"The authors examined in all 935 men convalescent from dysentery and 847 men with other diseases, but chief emphasis is laid on 229 dysentery convalescents, whose histories were thoroughly enquired into. About half of these were recovering from their first attack; the others had had more than one attack.

"Sixty-one were found to be carriers of Flexner bacilli; 13 were Shiga carriers; 122 had *Ent. histolytica* (of these nine had bacilli also); 42 were negative.

"In the whole series of 935 men, 5.5 per cent were Flexner carriers and 1.3 per cent Shiga carriers, while among the 847 non-dysentery cases there were 1 per cent of Flexner carriers, but no Shiga carriers.

"All men infected with Shiga were persistent carriers, and were permanently unfit for work in the Army, but only one-fifth of the Flexner carriers were persistent. In these the carrier condition is very intermittent; bacilli may be absent from the stools for four or five weeks and then reappear. Nearly all Flexner carriers were fit for work under favourable conditions, but the authors protest against such cases being sent on active service, since they nearly always relapse." (P. F. in Med. Sci., Abs. & Rev., Lond., 1919, 1, 227.)

770. *De la pathogénie du cholera. I. La défense naturelle du péritoine contre les vibrions.* (The Pathogenesis of Cholera. I. The Natural Defense of the Peritoneum against the Vibrios.) G. SANARELLI. Ann. de l'Inst. Pasteur, Par., 1919, 33, 837-881.

The literature on experimental cholera is full of contradictory reports, in the writings of both Koch and Pfeiffer. There is no agreement in opinions on the pathogenesis of the infection. The chief method of studying experimental cholera has been the investigation of the effects of intraperitoneal injections of the vibrios. Sanarelli shows that the examination of the exudate produced in this "cholera-peritonitis" leads to false conclusions, as it throws a little light on the humoral reactions, but shows nothing of the important cellular reactions—phagocytosis.

Sanarelli finds that the omentum is the most important structure in the peritoneal cavity for the defensive reactions of the normal guinea pig. Preparations of the omentum were made by cutting out discs of the thin membrane stretched over small rings, fixing the tissue in alcohol, staining it with Unna's polychrome methylene blue, clearing in bergamot oil and mounting in balsam. Such preparations were made at frequent (15-minute) intervals after the intraperitoneal injection of a sublethal dose of cholera vibrios. The phases of the reaction which occurs in and upon the omentum are shown in 12 colored plates.

The stages of the reactions are as follows: The bacteria, like inert particles, after injection into the peritoneum become adsorbed upon the omentum and penetrate the thin membrane and lymphatic vessels. Three minutes after the intraperitoneal injection of a sublethal dose of the vibrios, the organisms were found in the omental lymphatics and in the blood from the jugular veins. An intense transitory vibriemia is thus produced, the results of which will be reported in a later paper.

Leucocytes disappear suddenly from the peritoneum, not through phagolysis, but because they also become massed upon the omentum, opposing the first barrier to the bacteria. At the same time, the blood-vessels of the omentum become dilated and there is a rapid diapedesis of leucocytes into the omental tissue. An intense phagocytosis now occurs, in which all accessible vibrios are reduced by the phagocytes to the granular stage described by Pfeiffer. Any granular transformation of the vibrios through the action of the fluid of the exudate is secondary to the cellular reaction, bacteriolytic substances being liberated by the cells. Macrophages remove the injured polymorphonuclear leucocytes, restoring the condition to normal within 48 hours.—S. B-J.

771. *Ueber eine abgeschlossene Choleraeidiemie mit zahlreichen Mischinfektionen.* (An Isolated Cholera Epidemic with many Mixed Infections.) MEGGENDORFER. Centralbl. f. Bakteriologie (etc.), Jena. I. Abt., Orig., 1918, 80, 273-290.

An outbreak of cholera among a small group of soldiers due to eating green lettuce which had been washed with water from a polluted well, is described. The cholera vibrio was isolated from the well and from a trench which was proved to be a source of pollution of the well.

The outbreak is peculiar in that a large proportion of the cases were complicated by typhoid, paratyphoid and dysentery infections. Thus 6 per cent had cholera, paratyphoid and dysentery; 2 per cent had cholera and dysentery; 20 per cent had cholera and typhoid or paratyphoid; 48 per cent had cholera alone; 24 per cent had typhoid or paratyphoid.

Thirty-two strains of cholera isolated were identical with 20 old strains.—M. L.

772. *A Report on the Investigation of an Epidemic Caused by Bacillus aertrycke.* H. M. PERRY AND H. L. TIDY. Med. Research Committee, Spec. Rep. Series, No. 24, 1919.

"An investigation into the nature of an epidemic of diarrhoea with 4 deaths which occurred among troops in a camp. The disease was characterized by diarrhoea of varying degrees of acuteness, with vomiting in the severer cases. The onset was sudden, pyrexia was the exception. A bacillus identical with *B. paratyphosus* B was isolated from the stools of the cases, but upon closer investigation by means of agglutinin absorption tests it was found to differ from Paratyphoid B and to correspond to *B. aertrycke*.

"The authors formed the conclusion that the outbreak was due to a human carrier on the grounds that one of the cook-house staff had *B. aertrycke* in his stools, and had suffered from recurrent diarrhoea for some time previously." (P. F. in Med. Sci. Abs. & Rev., Lond., 1919, 1, 228.)

773. *Infectious Meteorism.* MAX EINHORN. South. M. J., Birmingham, 1920, 13, 92-95.

Four case reports with discussion from which the author concludes that there is a type of meteorism not due to obstruction but to an infection.—J. H. B.

## DISEASES OF THE GENITO-URINARY SYSTEM

(See also Numbers 697, 715, 818)

774. *The Diagnosis of Primary Syphilis by Culture.* FRED W. BAESLACK AND WILLIAM E. KEANE. J. Am. M. Ass., Chicago, 1920, 74, 392.

The authors give a medium for the cultivation of *Spirochaeta pallida* as follows: Normal horse serum free from preservative is diluted with distilled water as 3:1. The diluted serum is placed in test tubes closed with rubber stoppers, previously sterilized. The tubes are filled to within one inch from the top, stoppered and heated to 60°C. in a waterbath for 1 hour. The following day they are heated to 70°C. for 1 hour; the third day they are heated at 70°C. until the serum is of the consistency of syrup. A piece of the diseased tissue is pushed into the medium one-half to two-thirds of the length of the tube. The tube with the medium is warmed to body temperature before inoculation. Inoculated tubes are incubated at 37°C. for 3 to 5 days. For examination by dark field illumination a few drops near the tissue are removed with a pipette. Spirochetes can be seen in the presence of contaminating organisms.—P. G. H.

775. *General Prognosis of Syphilis in the Light of Recent Progress.* SIGMUND POLLITZER. J. Am. M. Ass., Chicago, 1920, 74, 775.

The discovery of the spirochete of syphilis, the use of the Wassermann test and the therapy with organic arsenic compounds have added much to the possibilities of attacking syphilis by prophylaxis at the moment of infection. A diagnosis can be made before the system is swarming with spirochetes and the necessity for further treatment even in the absence of symptoms is recognized. The disease can be detected in the central nervous

system before clinical symptoms are manifest. Arsphenamin is a remedy which is far superior to mercury. These additions to our knowledge of syphilis will undoubtedly be of benefit to coming generations.—P. G. H.

776. *Reporting Syphilis to State Boards of Health.* RUPERT BLUE. Texas State J. M., Fort Worth, 1920, 15, 355-356.

The author calls attention to the fact that particularly in the southern states there has been a marked increase in the number of cases of venereal diseases reported, which increase is due almost wholly to the reporting of syphilis. He believes that this is not due to the actual disproportionate increase of syphilis but that many cases of gonorrhea go untreated and that the interest shown by physicians is much more marked in syphilis.—J. H. B.

777. *Early Diagnosis and Treatment of Syphilis.* I. L. MCGLOSSON. Texas State J. M., Fort Worth, 1920, 15, 356-358.

A plea for early diagnosis by the dark field illumination with early intensive treatment.—J. H. B.

778. *Early Diagnosis and Treatment of Syphilis, as Taught in the Army.* NED SNYDER. Texas State J. M., Fort Worth, 1920, 15, 358-362.

A general description of the diagnosis and care of early syphilis.—J. H. B.

779. *Syphilis in Railroad Employees (A Clinical Study of an Occupational Disease).* JOHN H. STOKES AND HELEN E. BREHMER. J. Indust. Hyg., Boston, 1920, 1, 419.

The report is based on a general medical examination of 1763 patients of the Mayo Clinic.—C. E. T.

780. *Venereal or Sexual Disease; Its Causes, Consequences, Prevention and Free Treatment.* CHARLES PORTER. Med. J. S. Africa, Johannesburg, 1919, 15, 104-109.

The subject is discussed under three headings: (1) syphilis; (2) gonorrhea; (3) chancroid. Special attention is given to the problem from the public health point of view.—C. P. B.

## DISEASES OF THE NERVOUS SYSTEM

(See also Numbers 661, 817)

781. *Studies in Infection II. The Paths of Spread of Bacterial Exotoxins with Special Reference to Tetanus Toxin.* F. H. TEALE AND DENNIS EMBLETON. J. Path. & Bacteriol., 1919, 23, 50-68.

The authors draw the following conclusions from a large number of experiments designed to determine the mode of spread and the ultimate destiny of tetanus toxin following subcutaneous, intravenous and intraneural inoculations:

1. "That although tetanus toxin ascends to the central nervous system by way of the axis cylinders of the nerves, it also to a very great extent passes up the nerves to the cord by way of the perineural lymphatics. Blocking of the latter paths greatly delays and in some cases completely prevents the occurrence of tetanus in the part corresponding to the nerve whose lymph path has been blocked.

2. "Although tetanus toxin passes rapidly from the blood vessels into the connective-tissue spaces and thence to the thoracic duct, the toxin does not pass from the capillaries of the central nervous system to the tissues thereof.

3. "Tetanus toxin does not pass from the choroidal plexus to the cerebro-spinal fluid.

4. "Although bacteria can pass through the posterior root ganglion to the cord, colloidal pigments and tetanus toxin are prevented from doing so.

5. "Iodine, although it prevents tetanus toxin from producing its characteristic effects when iodised toxin is inoculated subcutaneously or intravenously, does not affect the toxin when inoculated intracerebrally, it does not hinder the occurrence of the typical symptoms of cerebral tetanus, and there is no apparent diminution in its toxicity.

6. "Tetanus antitoxin does not pass to the central nervous system either by way of the blood vessels, axis cylinders, or neural lymphatic channels. It also cannot pass from the cerebrospinal fluid when inoculated intrathecally into the substance of the cord. The antitoxin simply acts by combining with the circulating toxin, and that at the seat of production, and prevents it from reaching the central nervous system. The toxin already in this position is unaffected."—C. G. B.

782. *A Contribution to the Histopathology of Epidemic ('Lethargic') Encephalitis.* P. BASSON AND G. B. HASSIN. Arch. Neurol. & Psychiat., 1919, 2, 24.

"The report is based upon the examination of three cases. The histological findings are summarized as follows. There was a mild leptomeningitis; the vessels of the pia being congested, with marked perivascular infiltration with plasma cells and lymphocytes.

"In the cerebral cortex parenchymatous changes predominated: chromatolysis, neurophagia, and glia cell proliferation. Vascular changes were minimal. In the basal ganglia, substantia nigra, and tegmentum, in addition to the parenchymatous changes detailed above, there were marked interstitial changes, plasma cell and lymphocyte infiltration round the vessels so as to occlude these.

"The internal capsule, pons, and cord showed mainly these interstitial changes. The fibres of the hemispheres showed no myelin degeneration.

"They conclude that both parenchymatous and interstitial changes exist independently. The findings are characteristic of an encephalitis and differ from those found in Wernicke's polioencephalitis superior and in influenzal encephalitis in the absence of foci of softening, of large haemorrhages, and in the absence of polymorphonuclear leucocytes and gitter cells.

"They consider that epidemic encephalitis is a disease *sui generis*, but that the histological picture is indistinguishable from that found in African sleeping sickness due to tripanosome infection."—(F. M. R. W. in Med. Sci., Abs. & Rev., Lond., 1919, 1, 226.)

783. *Bacteriology and Pathology in Six Cases of Encephalitis Lethargica.* P. F. MORSE AND E. S. CRUMP. J. Lab. & Clin. M., St. Louis, 1920, 5, 275-284.

This article reports upon the bacteriologic findings and the gross and microscopic pathology of 6 cases of lethargic encephalitis and discusses the clinical significance of the lesions. The authors isolated a staphylococcus-like organism which produced a lethargic condition in rabbits when the culture or its filtrate was injected subdurally.—F. W. H.

784. *Epidemic (Lethargic) Encephalitis: Clinical Review of Cases in the Pacific Northwest.* WILLIAM HOUSE. J. Am. M. Ass., Chicago, 1920, 74, 372.

Encephalitis occurs in mild epidemics. No hint of the method of spread is given and two cases in the same household were never observed. The disease is not contagious and there is no reason for quarantine. There are two types of invasion, a slow one, which is more common than the rapid one. No organisms were isolated from necropsies.—P. G. H.

785. *The Australian Epidemic of Acute Encephalomyelitis. A Consideration of the Lesion.* J. BARTON CLELAND AND A. W. CAMPBELL. J. Nerv. & Ment. Dis., N. Y., 1920, 51, 137-145.

A description of the lesions and a report of successful transmission to the monkey (*Macacus rhesus*), sheep, calf and horse by intra-cerebral inoculation.—F. W. H.

786. *Cerebro-Spinal Fever.* PHILIP N. RANDALL. Practitioner, Lond., 1920, 104, 152-153.

Report of a case of cerebrospinal fever due to the meningococcus. This case is reported because of two distinct attacks, one occurring in August and the other in November of the same year. Death followed the second attack.—C. P. B.

787. *Über akute eitrige Perimenigitis (Peripachymeningitis).* (*Acute Purulent Perimenigitis.*) MORAWITZ. Deutsches Arch. f. klin. Med., Leipz., 1919, 123, 298; Schmidt's Jahrb., 1919, 330, 140.

The clinical features of these cases of meningeal infection with staphylococci are reported.—G. H. S.

788. *Neurosyphilis Prophylaxis.* G. H. HAMPSHIRE. Texas State J. M., Fort Worth, 1920, 15, 365-368.

A plea for early investigation of the spinal fluid and intraspinal treatment.—J. H. B.

## DISEASES OF THE RESPIRATORY SYSTEM

(Except Influenza and Tuberculosis)

(See also Number 813)

789. *Acute Respiratory Disease Carriers.* LESLEY H. SPOONER. J. Am. M. Ass., Chicago, 1920, 74, 582.

Acute respiratory disease is more serious in the army than in civil life. Transient healthy carriers are more common than should be expected, judging by the incidence of the disease. In transient carriers the organisms disappear without treatment. Chronic healthy carriers are rare, excepting carriers of the saprophytic pneumococcus and *Streptococcus hemolyticus*. The disease is disseminated chiefly through chronic healthy carriers and diseased carriers. These latter are of the greatest importance, and respond to disinfection unsatisfactorily.—P. G. H.

790. *The Bacteriology of Influenza.* Editorial. M. J. Australia, Sydney, 1919, 6th year, 2, 421-422.

"Lister has investigated the bacterial content of the naso-pharyngeal mucus, of the secretions found in the lungs and pericardium, of the blood and of the pus found in the pleura of persons suffering from influenza. ("The Bacteriology of Epidemic Influenza on the Witwatersrand," Pub. of the S. African Inst. for Med. Res., April 30, 1919.) In all 95 patients served as the source of material for this investigation. The author is little inclined to place reliance on the findings in the examinations of the sputum and swabbings from the naso-pharynx, because the organisms commonly found in influenza are frequent inhabitants of the upper respiratory tract of normal individuals. Pneumococci, *Micrococcus catarrhalis*, staphylococci and diphtheroids were found in varying quantities. Organisms indistinguish-

able from Pfeiffer's influenza bacillus were isolated from three samples of sputum and from the swabbings of three throats. In the next place he investigated the bacterial content of the lungs of 56 natives who died of the disease on the gold mines. In 53 instances the influenza bacillus was cultivated; pneumococci were found in 42 specimens, while other organisms were found in small numbers and on infrequent occasions. In four lungs the influenza bacillus was present in pure culture. Blood was examined six times. It was taken from four European women and two natives during the acute stage of the disease. Only once was an organism isolated. It proved to be a pneumococcus of type II. (group *B* of Lister's classification). Pus from empyemata was studied six times. In three cases it contained *Streptococcus haemolyticus*. In one there was *Staphylococcus albus* and in the fifth a pneumococcus and the influenza bacillus. The pneumococci isolated in the investigations were studied. The most prevalent was Lister's sub-group *B* and sub-group *E*. The pneumococci usually found in epidemic pneumonia, groups *A*, *B* and *C*, were absent in all but one case. These cocci, according to Lister, do not inhabit the upper respiratory tract under normal conditions. Those that were found, on the other hand, are the usual types found in healthy persons. Dr. Lister expresses the opinion that the results of his investigations appear to indicate that the *Bacillus influenzae* is the cause of the primary infection in influenza. He recognizes the prudence of leaving it undetermined whether this organism is a secondary invader or the primary cause, but in the absence of more complete knowledge he is inclined to accept the latter alternative. He suggests that the influenza bacillus lowers the resistance of the individual to such a degree that he becomes an easy prey to bacteria normally present in the upper respiratory tract. In regard to the question of prophylactic or therapeutic vaccination, he states that it is hardly worth discussing. Much has to be discovered before it is possible to form an opinion concerning the possibilities of prophylactic or therapeutic vaccination with the influenza bacillus. To vaccinate against complications, is, to his mind, putting the cart before the horse. He regards wholesale inoculations in the midst of an epidemic at the present time, as quite unjustifiable.

In conjunction with Dr. E. Taylor, Dr. F. S. Lister has undertaken some experimental work in connection with selected influenzal infections. ("Experimental Investigations of Epidemic Influenza at Durban," *Ibid.*) Endeavors were made to infect eleven volunteers and four monkeys (*Cercopithecus lalandi*). Special precautions were taken to prevent any of the volunteers or monkeys from being infected in the usual manner. He admits, however, that, although none of the volunteers had suffered from the disease before the beginning of the experiments, nine had certainly been exposed to infection. In a few instances the exposure to infection was prolonged and intimate. It is therefore not improbable that some of these men were naturally resistant to the disease. The infective material was derived from the naso-pharyngeal washings and the sputum from patients in different stages of infection. The material was filtered through Berkefeld "N" candles. We would point out in this place that, until the fluid is shown to contain the infecting organism, it is useless to employ filtration. The infected or supposedly infective fluid was sprayed into the noses and mouths of the volunteers and monkeys. Similar experiments were carried out with cultures of three strains of influenza bacillus and with a Gram-negative diplococcus, resembling the meningococcus or *Micrococcus catarrhalis* to some extent, as well as with a Gram-positive coccus isolated from a patient with typical influenza. Spraying with these bacteria failed to produce any illness. Two of the volunteers developed a febrile disturbance about 36 hours after a spraying with unfiltered naso-pharyngeal washings from a nurse on the third day of disease and from a male patient on the fourth day of the disease. The monkeys treated with the same material remained well, as did three other volunteers who received unfiltered washings. No illness followed the spraying with filtered material. The unsatisfactory histories of the volunteers as regards previous exposure to infection, the small number of experiments, the negative results in all the monkeys and the failure to demonstrate the usual secondary invaders in the two alleged positive experiments lead us to doubt whether any deductions can be drawn from these experiments."—A. P. H.

791. *The Fate of Bacteria Introduced into the Upper Air Passages. II. B. coli and Staphylococcus albus.* ARTHUR BLOOMFIELD. Johns Hopkins Hosp. Bull., Balt., 1920, 31, 14-19.

Within 24 hours after being swabbed on the tongue and nasal septum *B. coli* and *Staphylococcus albus* usually disappeared but when introduced into tonsil crypts they could be recovered after a somewhat longer interval. Inert particles also disappeared at about the same rate of speed. From the experiments performed the author believes these organisms probably disappear because they are mechanically removed more rapidly than they multiply.—F. W. H.

792. *Pulmonary Anthrax: Report of a Case.* W. R. BROOKSHER, JR. AND J. A. BRIGGS. J. Am. M. Ass., Chicago, 1920, 74, 323.

A case is reported. Sputum examinations and blood cultures are the methods of diagnosis. Early diagnosis is necessary and vigorous treatment by intravenous injection of anti-anthrax serum is the only hope of recovery. Pulmonary anthrax may appear without evidence of a violent pneumonia and still prove fatal owing to a toxemia.—P. G. H.

793. *Syphilis of the Tracheo-Bronchial Tree, with Report of a Case of Gumma of the Trachea.* SIDNEY ISRAEL. Texas State J. M., Fort Worth, 1920, 15, 362-365.

A brief review of some of the literature and a case report.—J. H. B.

## INFLUENZA

(See also Numbers 500, 693, 864, 865, 866, 870)

794. *Observations on the Bacteriology of Influenza.* EDWIN O. JORDAN. Pub. Health Rep., Wash., 1919, 34, 1413-1425.

From observations made on a series of influenza cases and other respiratory tract infections it was found that the bacteriological picture in influenza is not a uniform one so far as nose and throat flora are concerned. The ordinary methods of cultivation with uncooked blood agar plates show marked differences in individual cases and in groups.

The two organisms most commonly and abundantly present in this series were the Pfeiffer bacillus and the diplococcus of Mathers. The former was found in 64 per cent of the influenza cases examined between October, 1918 and February, 1919. It was not found in the pneumonia cases as frequently as in the uncomplicated cases. The Mathers coccus was found about as frequently and abundantly as the Pfeiffer bacillus, and its association with the pneumonia cases seemed to be closer than that of the Pfeiffer bacillus. In the true influenza cases there is a general leucopenia, while in the cases of colds and tonsillar infections there is a general leucocytosis. In the latter, there was a relative infrequency of the Pfeiffer bacillus, and a relatively high proportion of hemolytic streptococci. The Mathers coccus was found in about the same proportion of cases as in influenza. The pneumococcus, *M. catarrhalis*, the Friedländer bacillus, and the staphylococcus were also found at times in large numbers in the influenza cases.—C. E. T.

795. *The Bacteriological Flora of the Respiratory Tract in Cases of Influenza.* H. G. GIBSON AND F. B. BOWMAN. Med. Research Committee, Spec. Rep. Series, No. 36, 1919, 37.

"All primary cultures for isolation of bacteria were made on plain human blood agar. No special influenza medium was used for the isolation of *B. influenzae*."

"In the examination of material from various parts of the respiratory tract obtained *post mortem*, the pneumococcus was not found. *Streptococcus viridans* was much more common than haemolytic streptococci. The incidence of *B. influenzae* was variable, being found frequently only in scrapings of the trachea. Blood cultures were made upon 20 patients and *B. influenzae* was not found."

"Agglutination tests of formalized cultures with patient's serum appear to have been sometimes unsatisfactory, since a greater agglutination occurred with the highest dilutions of serum. *S. viridans* was not agglutinated with patient's serum." (P. F. in Med. Sci., Abs. & Rev., Lond., 1920, 1, 438.)

796. *Pathological and Bacteriological Findings in Fatal Cases of Pneumonia During the Influenza Epidemic of October and November, 1918.* W. H. TYTLER, R. M. JAMES AND G. M. DOBBIN. Med. Research Committee, Spec. Rep. Series, No. 36, 1919, 77.

"The authors made their cultures from *post mortem* material for the most part on unaltered blood agar. *B. influenzae* was present in the lungs in practically every case (in 60 out of 67 cases). Haemolytic streptococci were very rare. *B. influenzae* was probably the cause of the bronchitis and the primary cause of the pneumonia, paving the way for the growth of other bacteria." (P. F. in Med. Sci., Abs. & Rev., Lond., 1920, 1, 438.)

797. *Report on the Bacteriology and Pathology of Forty-six Fatal Cases of Influenza.* J. W. PATTERSON, E. M. LITTLE AND S. E. WILLIAMS. Med. Research Committee, Spec. Rep. Series, No. 36, 1919, 88.

"The bacteriological findings were similar to those of others, *B. influenzae* being practically constant *post mortem*. Experiments were conducted to determine which animal was most suitable as a source of blood for growth of *B. influenzae*. Rabbit was found to be best, then horse, and lastly human. Human blood agar often failed to give a growth. All bloods when heated to 80°C. became equally efficacious and the growth was always more luxuriant." (P. F. in Med. Sci., Abs. & Rev., Lond., 1920, 1, 438.)

798. *The Transmission of Influenza.* NICOLLE AND LEBAILLY. Pub. Health Rep., Wash., 1919, 34, 124-125.

Nicolle and Lebaillly inoculated the bronchial expectoration (rich in various bacteria) of an influenza patient, who had been ill for two days, (a) without filtration into a Chinese bonnet monkey, and (b) with filtration into two human subjects. The following results were obtained: (1) The monkey was sensitive to the virus by subconjunctival and nasal channels; (2) The agent appears to be a filterable organism, as the filtrate has produced the disease in two persons injected subcutaneously. The venous injection appears to be inefficacious; (3) It is possible that the grippal virus is not found in the patient's blood, as no positive results have been obtained from injection of blood.—C. E. T.

799. *Use of Anaerobic Culture Methods in the Study of Influenza.* JOHN F. NORTON. Am. J. Pub. Health, Concord, 1919, 9, 593-594.

Anaerobic and aerobic cultures were made from sputum (18 samples), tonsils and nasopharynx ("a few"), and blood (10 samples) variously upon serum water, ascitic agar, heated and unheated blood agar. In all cases no strict anaerobes were encountered. The materials were obtained, apparently, from patients within 1-4 days after admission to the hospital.—I. S. F.



800. *The Etiology of "Influenza."* A. W. WILLIAMS. Proc. N. York Path. Soc., 1918, 18, 83-90.

The author reports the methods of study followed, laboratory technic employed, and the results obtained in a series of about 200 cases diagnosed clinically as influenza. The data are tabulated and discussed. The conclusions are as follows:

"The evidence in favor of the influenza bacillus being the initiating cause of the present pandemic of 'influenza' is not strong enough to constitute proof. No evidence as strong has been brought forward in favor of any other cause.

"Whether or not the *B. influenzae* is the initiating cause, it has given evidence that it has a marked pathogenic action and the study of a vaccine to prevent this action should be continued until we are at least sure that it can give us no positive results."—L. W. F.

801. *Differences in Pathology of Pandemic and Recurrent Forms of So-called Influenza.* DOUGLAS SYMMERS. J. Am. M. Ass., Chicago, 1920, 74, 646.

The first recurrent epidemic of influenza in New York presented anatomic variations from the pandemic disease of a year before. In the pandemic disease of 1918 the participation of the pleura in the pneumonic process was rare. In the recurrent epidemic pleural involvement occurred in 60 per cent of cases. The pleural fluid contained streptococci in most instances and occasionally staphylococci and pneumococci. In the intrapulmonary abscesses a pure growth of *Str. hemolyticus* was almost invariably found and occasionally *Staph. aureus*. Influenza bacilli and pneumococci were sometimes isolated. In three cases the exudate was sticky and in two of these *B. mucosus capsulatus* and in the third *Str. mucosus* was found. Streptococci were isolated from the blood during life.—P. G. H.

802. *Epidemiology of Influenza-Pneumonia.* CHARLES LYNCH AND JAMES G. CUMMING. J. Lab. & Clin. M., St. Louis, 1920, 6, 364-373.

The authors state their conclusions as follows: "It is believed that the results of our epidemiologic studies and laboratory research show that indirect spread through the hand or hand auxiliary to the mouth is by far the most important and major route of contagion dissemination. Granting that this is true, preventive measures will not consist of periodic masking of the populace, but simply an intensification of the rules of personal hygiene, hand hygiene and especially the sanitation of eating utensils and the protection of food. The most ordinary social requirements demand clean hands, clean eating utensils, and the protection of food supplies. But we must extend this to include the actual sterilization of eating utensils both in the army and in civilian life. In both, boiling water is essential for sanitary dish water. In civil life this should be provided in restaurants and the like by washing machines. In the army, if mess kits are utilized, the washing water must be boiling for two reasons, viz., to sterilize the mess gear and to prevent soldiers from putting their hands into it and so contaminating it or their hands as the case may be."—F. W. H.

## TUBERCULOSIS

(See also Numbers 551, 631, 632, 843, 845, 863)

803. *Ueber den Mechanismus der Tuberkulinreaktion. (The Mechanism of the Tuberculin Reaction.)* E. SELIGMANN AND F. KLOPSTOCK. Ztschr. f. Immunitätsforsch. u. exper. Therap., Jena, 1919, 23, 454-456.

The authors proposed the following hypothesis to explain the tuberculin reaction: The tuberculous animal is killed by a sufficient dose of tuberculin because a new poison from the tuberculin is elaborated in the animal's body and that this poison, circulating in the blood stream, causes a general intoxication.

Various experiments devised to test this supposition were negative, in that no unusual toxic substance was demonstrable in the blood of tuberculous animals after treatment with tuberculin.—S. B.-J.

804. *The Check to the Fall in the Phthisis Death-rate since the Discovery of the Tubercle Bacillus and the Adoption of Modern Treatment.* KARL PEARSON. Biometrika, Lond., 1919, 12, 374-376.

The author points out that from 1865 to 1895 there was a continuous and rapid fall in the corrected death-rate due to tuberculosis, and also in the percentage of deaths from phthisis in relation to deaths from all causes. It is also pointed out that since 1895 there has been a check to this rapid fall and the curves seemed to indicate that an actual rise in the death-rate might be expected in the near future. Diagrams plotted to include the years of the war seem to indicate that this anticipated rise has already occurred. The conditions of the war years differ in so many respects, however, from pre-war conditions that the curves are extremely difficult to interpret satisfactorily.—R. E. B.

805. *Ueber die Bedeutung der Lipide bei der Tuberkuloseressistenz. (On the Significance of Lipids in Resistance Against Tuberculosis.)* J. DE SEIXAS PALMA. Centralbl. f. Bakteriologie (etc.), Jena. I. Abt., Orig., 1919, 83, 231-254.

The lymph gland lipoids secured from tuberculous cattle, dissolved in olive oil or emulsified in bile, produce edema and necrosis when injected subcutaneously into animals. In

some cases the injection proves fatal. In order to secure a more easily resorbable form these lipoids were transformed into soap and a distinction drawn between the saturated and unsaturated fraction. Both saturated and unsaturated soap from lipoids, prepared from the healthy mesenteric glands of tuberculous animals, proved to be poisonous. Determination of the iodine numbers of lipoids from the mesenteric glands and from the pancreas showed a certain contrast in their relationship to tuberculous infection. The free fatty acids secured from the mesenteric glands of tuberculous cattle showed more unsaturated groups than their mother substance and than the analogous acids secured from healthy glands. The reverse was found in the pancreas, that is, the pancreas from healthy animals took up more iodine than the pancreas from tuberculous animals. Lipoids from healthy and tuberculous animals show a marked and constant difference. Characteristic for the tuberculous lipoids is a lower melting point, and a darker color which goes over into a brown upon heating. Studies were made of the effect of the various lipoids and their soaps upon the course of tuberculosis. Saturated soaps from the pancreas were injected without injury into man and were well borne. —R. E. B.

806. *Conjugal Tuberculosis*. Anon. Pub. Health Rep., Wash., 1920, 35, 219-221.

The question of infectivity still remains one of the most important questions to be settled in regard to tuberculosis. The relative infrequency of conjugal infection in tuberculosis has been frequently noted. Fishberg, in the latest edition of his work on "Pulmonary Tuberculosis" comes to the following conclusions:

"(1) Tuberculosis infection can only occur once, and (2) phthisis evolves only in persons who are for one reason or another predisposed to the disease. It is the constitution of the nonphthisical consort, rather than opportunities for reinfection, which determines whether infection will develop. Recently E. Ward, M.D. tuberculosis officer for S. Devon, has challenged this view in an article entitled "Conjugal Tuberculosis." Out of 156 cases extending over a period of 5 years in which the mate of a tuberculous husband or wife was examined, the percentage of positive tuberculous findings was 55 per cent of wives and 69 per cent of husbands. Of 1,067 contacts, other than husband and wife, examined, only 20 per cent were found positive. Of 81 contacts of cases diagnosed as nontuberculous, only 5 per cent were found positive.—C. E. T.

807. *Tuberculosis as a Focal Disease*. EDWARD JACKSON. J. Am. M. Ass., Chicago, 1920, 74, 433.

Tuberculosis is the sum of the defensive local and general reactions of organisms against the tubercle bacillus and the sequels of such reactions. The typical tubercle is a typical focal infection. Very little is known about the path of infection of the tubercle bacillus. Two portals of entry have received much attention, the respiratory tract and the alimentary tract. The tubercle bacillus gets entrance to the body long before the effects of its presence are recognizable, and often makes itself known first in the interior of the eye, in the head of the femur, or the bodies of the vertebrae. It may enter without giving the slightest evidence at the point of entry. In the human being, pulmonary tuberculosis is always discovered after the essential lesion has run its course, broken down and is discharging bacilli. In animal experimentation there are great gaps between the inhalation of the bacilli and the finding of lesions in the lungs. Evidence of lesion at the point of entry occurs only in wart-like lesions and a few cases of tuberculosis of the conjunctiva. The bacilli find their way into the blood without provoking reactions. The majority of human beings harbor tubercle bacilli at some time of their lives. The war against tuberculosis must be directed towards building up tissue immunity.—P. G. H.

808. *Tuberculosis. A City Plan*. C. V. CRASTER. J. Am. M. Ass., Chicago, 1920, 74, 302.

The city plan for tuberculosis control proposed consists of: (a) control of infection; by reporting by physicians; hospitals and sanatoriums; day camps and tents; field nurses; laboratory; enforcement of antispitting laws; milk supervision; (b) social progress; publicity; social insurance; antituberculosis societies; home visiting and relief; (c) economic improvement: housing; industrial hygiene; open air school; vocational training; employment bureau; (d) associated activities: control of epidemics; convalescent homes; child hygiene; mental hygiene.

The author discusses these points in detail.—P. G. H.

809. *Hookworm and Manifest Tuberculosis*. ROY D. ADAMS. South. M. J., Birmingham, 1920, 13, 105-108.

The author concludes that there is no evidence of specific relationship between the two diseases but that a general lowering of resistance may be an important factor.—J. H. B.

## DISEASES OF CHILDREN

810. *The Schick Test and Active Immunization against Diphtheria*. Pub. Health Rep., Wash., 1919, 34, 1063-1068.

A negative reaction obtained in a child which has reached the age of 3 years indicates an immunity which is probably permanent. Of 1000 such cases carefully observed, not one developed diphtheria later, even though they were exposed to the disease and some were carriers of virulent diphtheria later.

The use of the Schick test will avoid unnecessary sensitization of more than 65 per cent of the exposed individuals. It is also of distinct value in the active immunization of susceptible individuals against diphtheria with mixtures of toxin-antitoxin, and in the diagnosis of clinically doubtful cases. By active immunizing 4000 susceptibles without the subsequent occurrence of a single case of diphtheria. Such immunity lasts for at least 3 years. The development of an active immunity is determined at the end of three months by means of the Schick test, as it does not develop before 2 to 12 weeks.—C. E. T.

## DERMATOLOGY

811. *Report of a Case of Anthrax.* G. NORBURY. Illinois Health News, 1920, 6, 9-13.

This article contains a brief review of literature and report of a case of anthrax coming under the writer's observations. Norbury gives the details in the development of this case which apparently was a shaving brush infection. Attempts to isolate *B. anthracis* from the brush were not successful.—F. W. T.

## OPHTHALMOLOGY

812. *The Trachoma Problem in Ohio.* F. G. BOUDREAU. Ohio Pub. Health J., 1919, 10, 418-424.

The cases of trachoma in Ohio are tabulated by counties. The plans of the State Department of Health with regard to this disease embody (1) survey of school children and other groups in localities where trachoma is known to prevail; (2) follow-up work in families where a case has been found; (3) establishment of trachoma hospitals at strategic points; (4) research into the epidemiological and etiological factors involved.—F. W. T.

813. *The Eye as a Portal of Infection in Respiratory Diseases.* H. J. CORPER AND J. J. ENRIGHT. J. Am. M. Ass., Chicago, 1920, 74, 521.

The eye is one of the important portals of entry of infection in respiratory diseases, and although the greater part of the infectious material entering by way of the eye is subsequently swallowed and passes into the gastro-intestinal tract, a small but definite portion finds its way into the larynx and trachea where it may persist as long as a week. In its passage from the eyes, the infectious material traverses a definite channel dependent on which eye it has entered or into which it has been introduced. Infectious material that is ingested is far less likely to enter the respiratory tract than that entering by way of the nose or mouth.—P. G. H.

814. *Two Cases of Eye Inflammation due to Infected Teeth.* CLIFTON M. MILLER. South. M. J., Birmingham, 1920, 13, 132-134.  
Brief case reports.—J. H. B.

## OTOLOGY AND NOSE AND THROAT DISEASES

815. *The Tonsil in Relation to Infectious Processes.* DAVID JOHN DAVIS. J. Am. M. Ass., Chicago, 1920, 74, 317.

Lymphoid structures attain two maxima of distribution: one in the throat and another in the region of the ileocecal valve and appendix; these maxima correspond in general to the normal distribution of bacteria in the alimentary canal. At these points the greatest number of pathogenic bacteria attack the body. Plasma cells appear shortly after birth under the mucosa and their presence probably indicates chronic adsorption of infectious and other material. Some organisms injected into the crypts of the tonsils disappear in a few days. The normal flora is restricted. Fusiform bacilli, streptococci and spirochetes appear as more or less normal inhabitants of the crypts. *Str. hemolyticus* is almost constantly found in the crypts. This should be considered in making throat cultures.—P. G. H.

816. *Hemolytic Streptococci in the Normal Throat after Tonsillectomy.* H. B. VAN DYKE. J. Am. M. Ass., Chicago, 1920, 74, 443.

A series of tonsillectomized throats of individuals in good health was examined and in 16.4 per cent there were markedly hemolytic streptococci. In 29 per cent there were less markedly hemolytic streptococci resembling Brown's Alpha prime type. There were no hemolytic streptococci in 55 per cent of the throats examined. The streptococci found, according to Holman's classification, were *Str. anginosus* and *Str. pyogenes*.—P. G. H.

817. *Postdiphtheritic Paralysis, with Report of Two Cases.* SAMUEL W. BOORSTEIN. J. Am. M. Ass., Chicago, 1920, 74, 512.

Diphtheritic paralysis occurs usually in the second or third week after illness. The frequency of its occurrence after injection of antitoxin is hard to state, while without antitoxin it occurs in about 5 to 15 per cent of the cases. There may be a localized or a generalized paralysis. In the localized form there may be paralysis of the palate or the muscles of the pharynx and larynx. The extremities are affected in the generalized form. The author had

good results by applying a collar made from thick felt, 1½ inches thick, rather solid and applied in a vertical position. The author thinks that orthopedic treatment, especially the application of the collar, hastens recovery.—P. G. H.

818. *Syphilis of the Throat, Nose and Ear.* DOUGLAS GUTHRIE. Practitioner, Lond., 1920, 104, 131-145.

Clinical paper; discussion of diagnosis and treatment.—C. P. B.

### ORAL BACTERIOLOGY

819. *Salvarsan bei Alveolarpyorrhoe.* (Salvarsan in Pyorrhea Alveolaris.) EULER. Therap. Monatsh., Berl., 1919, No. 4, 133; Schmidt's Jahrb., 1919, 330, 143.

Pyorrhea alveolaris is undoubtedly a spirochetosis. The *Spirocheta pyorrhoica* and *Bacillus fusiformis* are of etiological importance in the development of the condition. While these organisms are normally present they do not become pathogenic until they become extremely abundant. Salvarsan exerts a definite action upon the organisms. In mild infections the drug may be mixed with vaseline and glycerin and applied locally; in more marked cases local injections should be given, and in severe infections the salvarsan should be given by intravenous injection.—G. H. S.

820. *Focal Infection.* THOMAS D. COLEMAN. South. M. J., Birmingham, 1920, 13, 79-82.

The author calls attention to the growing tendency to remove suspected foci of infection without sufficient preliminary study and makes a plea for a more rational therapy based on careful diagnosis.—J. H. B.

### SURGICAL BACTERIOLOGY

821. *Vergleichende Untersuchungen über die Erreger des Gasbrandes und des malignen Oedems.* (Comparative Studies on the Cause of Gas Gangrene and Malignant Edema.) WALTER GAERTGENS. Centralbl. f. Bakteriologie (etc.), Jena. I. Abt., Orig., 1917, 80, 166-188.

The agglutination and precipitin tests were found to be of no value in differentiating anaerobes obtained from wounds. The complement fixation test showed quantitative differences between the malignant edema and Fraenkel bacilli.—M. L.

822. *Zur Frage der Toxinbildung von Gas-Oedem-Bazillen.* (On the Question of Toxin Formation by the Bacilli of Gaseous Edema.) F. KLOSE. Centralbl. f. Bakteriologie (etc.), Jena. I. Abt., Orig., 1919, 83, 305-314.

It is probable that blackleg in cattle is caused by several distinct organisms, and that the same is true of gaseous edema in man. Both diseases may, under certain conditions, be caused by the same organism. Studies made of the toxin production of the Ficker strain of the edema bacillus show characteristic reactions following intravenous injection into guinea pigs. The results of intraperitoneal injection into guinea pigs and intravenous injection into rabbits are also described. Toxin production by other members of the group, such as *Bacillus putrificus* of Bienstock and the Ghon-Sachs bacillus is discussed.—R. E. B.

### SEROLOGY

823. *The Influence of Deficient Nutrition on the Production of Agglutinins, Complement and Amboceptor.* STYVESTER SOLOMON ZILZA. Bio-Chem. J., Liverpool, 1919, 13, 172-194.

"The influence of deficient diets on the production of agglutinins and amboceptor in rats was investigated. The following deficiencies were studied:

1. Diets low in iron, calcium, potassium, sodium, chlorine and phosphorus.
2. Diets containing 12 per cent and 8 per cent of caseinogen as a source of protein.
3. Diets containing 18 per cent of gliadin as a full source of protein.
4. Diets deficient in each of the three accessory food factors."

"Although several of the deficiencies became manifest by the restricted growth and poor condition of the animals, no differentiation in the titres of the agglutinins and amboceptor could be recorded, except in the group receiving the diet low in phosphorus. Guinea pigs fed on an unrestricted, mixed diet, quantitatively restricted mixed diet and scorbutic diet showed no differentiation in the amboceptor and agglutinin titres, and in the complement activity of the blood."—R. E. B.

824. *Ueber die Beeinflussung der Agglutininproduktion.* (Influence on Agglutinin Production.) WALTER PFENNIGER. Centralbl. f. Bakteriologie (etc.), Jena. I. Abt., Orig., 1917, 80, 200-213.

The effect of intravenous injection N/10 Na<sub>2</sub>SO<sub>4</sub>, SrCl<sub>2</sub>, NaBr, m-Kresol, and Na-propionate on agglutinin production was studied. These salts, particularly NaBr, were found to markedly increase agglutinin production.—M. L.

825. *Ueber das Verhalten der Antikörper beim Verdünnen und Mischen verschiedener Immunsera.* (On the Behavior of Antibodies in Dilutions and in Mixtures of Various Immune Sera.) M. v. EISLER. Centralbl. f. Bakteriologie. (etc.), Jena. I. Abt., Orig., 1919, 83, 182-192.

A report of a study on the effect of diluting potent tetanus antitoxin with serums containing smaller amounts of tetanus antitoxin; containing none at all, from the horse, and from other sources. The results secured were variable, in some cases resulting in some loss in potency, in others showing no appreciable loss. Similar studies on diphtheria antitoxin show that mixtures of different diphtheria antisera with each other resulted in no apparent loss of antitoxin value. Similar results were secured with antihemotoxic sera. Tests on agglutinating sera show that neither through the dilution of a particular serum with homologous horse or foreign goat serum, nor through mixture of such sera with each other, did there occur any appreciable diminution of the agglutination titer. Mixtures of hemolytic sera gave no diminution but in some cases an increase in hemolytic power.—R. E. B.

826. *Die Gruber-Widal'sche Reaktion bei gesunden und kranken Typhusschutzgeimpften.* (The Gruber-Widal Reaction in Healthy and Sick Individuals who had been Inoculated against Typhoid.) BRÜSAMLEN. Deutsches Arch. f. klin. Med., Leipzig, 1919, 129, 208; Schmidt's Jahrb., 1919, 330, 136.

In healthy individuals a positive reaction is secured in 100 per cent of the cases when examined within 2 to 3 weeks after the inoculation. After 1 to 3 months, 95 per cent give a positive reaction, after which time the number slowly decreases. At the end of 1 year 56 per cent still show a positive, and after 2 years, 41 per cent are positive. Agglutination in a dilution of 1:100 was considered as a positive. The agglutination titre is not affected by fever, nor by bacterial or toxic stimuli, other than by infection with *B. typhosus* or related organisms.—G. H. S.

827. *Ueber spontan agglutinierende Typhusbazillen.* (Spontaneous Agglutinating Typhoid Bacilli.) FRITZ VERZAR. Centralbl. f. Bakteriologie. (etc.), Jena. I. Abt., Orig., 1917, 80, 161-166.

A typhoid bacillus, isolated from the urine of a patient, agglutinated spontaneously in physiological salt solution. This action was found to be a function of the concentration of NaCl, and that by reducing the salt to 0.425 per cent the culture became stable.—M. L.

828. *Zur Paragglutination.* (Paragglutination.) G. SALUS. Centralbl. f. Bakteriologie. (etc.), Jena. I. Abt., Orig., 1917, 80, 196-201.

*B. coli* and *B. fecalis alkaliogenes*, growing in the same tube with *B. typhosus*, for 5-14 days were observed to acquire the property of agglutinating with typhoid serum. This property was lost gradually in subsequent transfers.—M. L.

829. *The Weil-Felix Reaction as a Laboratory Test in the Diagnosis of Typhus Fever.* IDA A. BENGTON. Pub. Health Rep., Wash., 1919, 34, 2446-2450.

The Weil-Felix reaction consists of the agglutination of a proteus-like organism by the serum of the typhus patient. Two strains, *Proteus* X<sub>1</sub> and X<sub>1</sub>, have been isolated by Weil and Felix from typhus fever patients. Morphologically these strains are similar to the *Proteus vulgaris* in important points, but differ in degrees of reaction. There was a specificity of agglutination reaction between certain *Proteus vulgaris* strains and the X<sub>1</sub> and X<sub>1</sub> strains, but none with other of the *Proteus vulgaris* strains. Weil and Felix, as well as other Austrian and English authorities, ascribe this phenomenon of agglutination to the presence of the organism as a secondary invader; Felix isolated it 44 times from several hundreds of cases of typhus. Craig and Fairley, failing to demonstrate complement fixation, explain the reaction as due to the presence of secondary agglutinins. The fact that the reaction appears early in the disease and in a high percentage of cases, and is negative for other diseases, makes it useful as a diagnostic test.—C. E. T.

830. *Abnorme Serumreaktionen und die Weil-Felix'sche Reaktion.* (Abnormal Serum Reactions and the Weil-Felix Reaction.) L. DIENES. Ztschr. f. Immunitätsforsch. u. exper. Therap., Jena, 1919, 23, 447-453.

A bacillus, different from the Weil-Felix X<sub>1</sub>, was isolated from the urine of patients with typhus fever and other diseases and was used as the antigen in the agglutination tests reported in this paper. This bacillus was a small Gram-negative rod, actively motile. It did not form gas in dextrose and did not liquefy gelatin. Its colony was blue on Conradi-Drigalski and red on Endo's medium. The urine from which it was isolated was not obtained by catheter.

The serum of patients with typhus fever agglutinated this organism in dilutions as high as 1:400. In general, about 10 per cent of cases of typhus fever showed agglutinins for this bacillus. Positive agglutination reactions occurred only rarely with sera from cases of other diseases.

The author considers that this is a non-specific serum phenomenon, analogous to the Weil-Felix reaction. He discusses various hypothetical explanations of the reaction and concludes that the most plausible basis of these reactions lies in the activities of saprophytic bacteria in or upon the body. Possibly typhus fever allows these inhabitants of the lymph nodes or tissues to develop more readily and thus serve as antigens, causing the formation of agglutinins.—S. B-J.

831. *Zur Praxis und Theorie der Weil-Felixschen Reaktion. (The Theory and Application of the Weil-Felix Reaction.)* W. OERTINGER. *Centralbl. f. Bakteriol. (etc.), Jena. I. Abt.* Orig., 1918, 80, 304-339.

Technic for the diagnosis of typhus fever by agglutination with *Proteus* X19 is described. The reaction becomes positive during 4th to 6th day of the disease and persists for weeks or even months.

Reaction is regarded as an example of para agglutination and it is suggested that other para agglutinable strains be sought in the hope that one may be found which would serve to diagnose syphilis, smallpox, scarlet fever, etc.—M. L.

832. *Zur Theorie der Serologie des Fleckfieberblutes und zur Frage der Spezifität und ätiologischen Bedeutung der X-Stämme. (The Theory of the Serology of Typhus Fever and the Question of the Specificity and Etiologic Significance of the X Strain.)* EMIL EPSTEIN. *Centralbl. f. Bakteriol. (etc.), Jena. I. Abt., Orig.*, 1919, 83, 255-281.

The fundamental fact underlying the occurrence of serum reactions in the blood of typhus fever patients, including the Weltmann flocculation reaction, the Weil-Felix agglutination reaction, the agglutination of bacteria accidentally accompanying typhus, the Wassermann reaction and the complement fixation with bacterial suspension, is the physical change occurring in the typhus serum itself leading to increased flocculability. None of these reactions, therefore, can theoretically be recognized as specific in this disease. This increased flocculability is most directly observable in the Weltmann reaction. The complement fixation and the Weil-Felix agglutination reaction do not exhibit this fact quite so directly. The X strains of the *proteus* bacillus do not bear a causal relationship to typhus. Their agglutinability with the typhus serum depends upon secondarily acquired characters.—R. E. B.

833. *Agreement in Results of the Wassermann Reaction: A Study of Tests Performed by Two Laboratories in Three Thousand Successive Hospital Admissions.* HARRY C. SOLOMON. *J. Am. M. Ass., Chicago*, 1920, 74, 788.

Wassermann tests were made from 3000 patients by two independent laboratories. There was a complete uniformity of results in 93.44 per cent of the cases. The 6.56 per cent variation included cases reported as doubtful. Some of the cases reported positive by one laboratory and negative by the other were known to be syphilitic. The cases that either laboratory may have reported as positive in nonsyphilitic cases was 3.6 per cent. This is probably higher than the percentage of false positives than actually occurred. Repetitions of the tests resulted in a uniformity of findings in the majority of cases.—P. G. H.

834. *An Analysis of the Results of Wassermann Reactions in 1435 Cases of Syphilis or Suspected Syphilis.* P. FILDES AND R. J. G. PARNELL. *Med. Research Committee, Spec. Rep. Series, No. 23*, 1919.

"The object of this work was to show how the results of the Wassermann reaction compare in routine practice with the clinical findings. For this purpose the cases of 1435 consecutive admissions to hospitals were reviewed, the admissions being for syphilis or suspected syphilis. The tests were carried out by the technique of Fildes and McIntosh without knowledge of the clinical condition or history.

1777 men gave positive Wassermann reactions, and of these 1112 showed more or less conclusive evidence of syphilis. With regard to the 65 men with positive reactions who did not show conclusive evidence of syphilis, the great majority had gonorrhoea or sores upon the penis in which spirochaemes could not be found owing to previous local or general treatment. The authors state: 'Although we are unable to prove that every case in the series which gave a positive Wassermann reaction was syphilitic, nevertheless we are of opinion that a reasonable critic can hardly dispute the overwhelming importance of this result in diagnosis.'

258 men gave negative reactions, and 171 gave conclusive evidence of being syphilitic (spirochaemes in chancres, etc.). Eleven had no active lesions, but histories of syphilis. The remainder were in all probability non-syphilitic.

Taking the material from a different point of view:

There were 1359 cases of syphilis, of these:

1177 gave positive reactions.

161 gave negative reactions, but had spirochaemes in sores.

5 gave negative reactions, with sores without spirochaemes, but subsequently developed syphilis.

1 gave a negative reaction with manifest secondary syphilis.

2 gave negative reactions with manifest tertiary syphilis.

2 gave negative reactions in the serum with cerebrospinal syphilis.

11 gave negative reactions with no lesions but histories of syphilis.

Therefore 'it may be said that negative reactions in cases of syphilis which exhibit manifest signs (excluding early primary cases: Reviewer) are very rare whether they have been treated or not, and thus the negative test is of very great significance in the exclusion of a diagnosis of syphilis.'

Clinical and pathological details of the whole series of cases are appended." (P. F. in *Med. Sci., Abs. & Rev., Lond.*, 1, 234-235.)

835. *Ueber die Wassermannsche Reaktion im Blutserum, Bauchhöhlenflüssigkeit und Harn eines und desselben Kranken.* (The Wassermann Reaction in Blood Serum, Abdominal Fluid, and Urine of One and the Same Patient.) J. KOSTRZEWSKI. *Centralbl. f. Bakteriöl.* etc., Jena. I. Abt., Orig., 1918, 80, 450-455.

Describes a case which showed a positive Wassermann reaction in the urine. The blood serum and abdominal fluid were also positive, and the globulins of the blood serum were found to fix more complement than that of urine or abdominal fluid.—M. L.

836. *Des causes d'erreur dans la réaction de Wassermann, dues a l'antigène.* (Sources of Error in the Wassermann Reaction Due to the Antigen.) DURUPT. *Compt. rend. Soc. de biol.*, Par., 1920, 83, 2.

The source of error in employing different antigens lies in the extreme sensitiveness of some antigens. An antigen prepared from syphilitic liver gives 15 per cent more positive fixations than does an antigen prepared from heart.—G. H. S.

837. *Sur l'appréciation numérique de l'intensité de la réaction de Bordet-Wassermann.* (Numerical Expression of the Intensity of the Wassermann Reaction.) A.-D. RONCHÈSE. *Compt. rend. Soc. de biol.*, Par., 1920, 83, 18.

A further discussion of the ratio in which a normal serum will neutralize a positive serum.—G. H. S.

838. *Zur Technik der Kaupschen Methodik der Wassermannschen Reaktion.* (The Technic of Kaup's Modification of the Wassermann Reaction.) M. STERN AND H. DANZIGER. *Ztschr. f. Immunitätsforsch. u. exper. Therap.*, Jena, 1919, 23, 377-400.

Kaup's modification of the Wassermann reaction was devised for the purpose of making quantitative measurements of complement fixation. The usual anti-sheep red corpuscle hemolytic system is used, with guinea pig serum as complement. Two preliminary titrations are carried out. In one of these, constant quantities of 10 per cent complement are used with decreasing quantities of amboceptor. The red cells are then sensitized with 4 units of amboceptor, and complement titrated against these sensitized cells. In this second series, the complement is titrated in the presence of antigen (extract), normal serum and a mixture of normal serum and the antigen. The minimal dose of complement effective in the presence of both normal serum and antigen is thus determined. The antigen is carefully titrated for its anticomplementary and hemolytic action, and to determine the zone of dilution in which the antigen exhibits complete and most frequent binding with positive syphilitic sera.

When the test is carried out with careful attention to the preliminary titrations and controls, it is found to yield more constant results and a greater number of positive reactions than are obtainable by application of the original Wassermann method to the same sera. Comparative results on several hundred sera are presented.

Antigens made from normal heart muscle were found to be as useful as any of the so-called specific syphilitic extracts. Paradoxical reactions of sera, which were found to be positive on one day and negative later, were attributed to physical-chemical changes in the sera.—S. B-J.

839. *Wassermann Results with Anticomplementary Sera.* MILES J. BREUER. *J. Lab. & Clin. M.*, St. Louis, 1920, 5, 327-328.

The author titrates the complement-fixing power of the serum and then uses the dose of complement which gives complete hemolysis with the serum in this preliminary titration. The observations made so far suggest that high anticomplementary power does not interfere with a clear cut positive reaction, and therefore probably the syphilitic amboceptor is not concerned in the absorption of the complement occurring in anticomplementary action, but that this depends on hemolysis in most cases and increases with the age of the specimen.—F. W. H.

840. *A Brief Résumé of Vernes Method for Serum Diagnosis of Syphilis, Biologic and Physical—Chemical Phenomena of the Serum Reaction.* DAISY M. C. ROBINSON. *Pub. Health Rep.*, Wash., 1919, 34, 2665-2667.

Vernes ascertained that there were distinct zones of flocculation when varying quantities of serum are mixed with metallic or organic colloidal suspensions in distilled water, and that syphilitic serum and normal serum differ in this regard. By using such quantities of serum as those which produce a flocculation with syphilitic serum only, and by using a colloidal suspension of extract of horse heart muscle, standardized to a definite degree of opacity, Vernes worked out a method by which a syphilitic serum may be differentiated from a normal serum. He found that by using a fresh serum of the pig and sheep red corpuscles with the colloidal suspension and syphilitic serum, that the pig serum acts as an antiflocculent toward the syphilitic serum, at the same time losing some of its hemolytic activity. By measuring the degree of hemolysis by an artificial color scale, he is able to determine the degree of specific syphilitic change in the human serum in question.—C. E. T.

841. *Die Seroreaktion auf Lues nach Vernes. (The Vernes Sero-reaction in Lues.)* Schweiz. med. Wchnschr., 1919, 1, 51-53.

The technic suggested by Vernes was controlled by the regular Wassermann method in testing about 1200 sera. The tabulated results show:

Complete conformity in.....	900 cases; -76.7 per cent
Both positive in.....	204 cases
Both negative in.....	581 cases
Both questionable in.....	115 cases

Slight differences noted in.....	205 cases; -17.4 per cent
W. R. stronger than Vernes' method in.....	58 cases
W. R. weaker than Vernes' method in.....	147 cases

Strong differences noted in.....	57 cases; - 4.8 per cent
W. R. stronger than Vernes' method in.....	6 cases
W. R. weaker than Vernes' method in.....	51 cases

Absolute non-conformity in.....	13 cases; - 1.1 per cent
W. R. positive, Vernes' negative in.....	1 case
W. R. negative, Vernes' positive in.....	12 cases

—G. H. S.

842. *Note sur la réaction de la gomme mastic. (The Mastic Reaction.)* BELARMINO RODRIGUEZ. Compt. rend. Soc. de biol., Par., 1919, 82, 1352.

The mastic reaction was performed in parallel with the Lange test and the Wassermann reaction in 30 patients. It is concluded that in a majority of cases the mastic test and the Lange test are equally sensitive, although the latter test is perhaps the more sensitive and more constant.—G. H. S.

843. *Further Observations on Complement Fixation.* S. A. PETROFF. Am. Rev. Tuberc., 1920, 3, 683.

Complement and serum have been dealt with. The importance of the hydrogen ion concentration of salt solution and of cleansing the glassware has been pointed out. A review of antigens has been presented and their nature and chemical composition discussed. Substances corresponding to lecithin, kephalin, sphingomyelin, carnithin and cuorin were separated from tubercle bacilli, and a comparative study with some other antigens rich in proteins of tubercle bacilli was made. Lipins were anticomplementary in large doses, and had no antigenic properties in small doses. Proteins from tubercle bacilli do not give as strong reaction as an extract which contains proteins and lipins. Primary incubation time (antigen, antibodies and complement) is of great importance, and from one and one-half to two hours will give best results. Complement fixing antibodies are probably either globulins or substances absorbed with the globulins. We are still ignorant as to what is responsible for this reaction. The view that the precipitate formed during the union of antibody and antigen is responsible, could not be substantiated by us. We have as yet failed to demonstrate such precipitate in complement fixation tests in tuberculosis. The temperature is of great importance, and the optimum seems to be between 35° and 40°C. We consider the complement fixation test in tuberculosis more specific than the Wassermann test, basing our conclusions on experimental data. Complement fixation is only one of the many links in the tuberculosis diagnostic chain. In order to obtain reliable results the technic must be standardized and the test performed only by well trained workers.—T. G. H.

844. *Report on the Value of the Complement-fixation Test as a means of Differentiating between Enteric-Vaccinated and Typhoid-Infected Persons.* W. D. O'KELLY. J. Path. & Bacteriol., 1919, 22, 235-245.

The sera examined were derived from, (1) persons who had been vaccinated against typhoid and the paratyphoids, (2) cases of typhoid at various stages of the disease, and (3) persons who had neither been vaccinated nor had had typhoid. Saline extracts of the bacteria were used as antigens. The hemolytic system employed consisted of sensitized sheep's corpuscles and two hemolytic doses of complement. The sera to be tested were inactivated and 0.1 cc. used in each test.

It was found that 4 + reactions occur only within the first month after vaccination; 3 + reactions for 3 months; 2 + reactions for many months. 73 per cent of uninoculated persons gave negative results, the remaining 27 per cent giving only incomplete fixation. Typhoid convalescents gave complete fixation only after the thirty-fifth day of the disease.

It is concluded the complement-fixation test is of little importance as a diagnostic procedure in the entericas.—C. G. B.

845. *Sur la fixation du complément chez les tuberculeux. (Fixation of Complement in Tuberculous Individuals.)* FERNAND ARLOING AND RENÉ BIOT. Compt. rend. Soc. de biol., Par., 1919, 82, 1333.

The authors question the statement of Boez and Duhot; namely, that the presence of antibody does not seem to indicate a process of defense but rather a process of infection.—G. H. S.



846. *Die Methode des dicken Tropfens in Anwendung auf die Opsoninbestimmung. (The Method of Thick Drops in its Application to the Estimation of Opsonin.)* P. FROSCHE. *Centralbl. f. Bakteriologie* (etc.), Jena. I. Abt., Orig., 1919, 83, 400.

The author calls attention to the fact that in the original Wright method of opsonin determination, in which the capillary pipettes are incubated, there is danger that bacteria and leucocytes will be retained within the capillary tube. A substitute method whereby a hanging drop is used in place of the capillary pipette during the time of incubation, is proposed, and its advantages are pointed out.—R. E. B.

847. *Experiments on the Action of Unsaturated Fatty Acids and Lipoids on Amylolytic and Hemolytic Phenomena.* PERCY STOCKS. *J. Path. & Bacteriol.*, 1919, 23, 1-14.

The author summarizes his findings as follows:

1. "Sodium oleate and other oleates inhibit the action of diastase in starch.
2. "This inhibitory reaction exhibits the quantitative characters of a chemical combination between the two substances.
3. "The diastatic activity of normal blood serum is also inhibited by oleates.
4. "Pure fats and other lipid substances were not found to inhibit diastase.
5. "Inactivated human serum showed no anti-diastatic property.
6. "This inhibiting action of oleates on the diastase-starch reaction affords a simple method of detecting and estimating oleates in a solution.
7. "Oleates in sublytic concentration enter into combination with washed red blood corpuscles, and can be completely removed from a solution by separating the corpuscles with a centrifuge.
8. "The affinity of red corpuscles for oleates is more powerful than the affinity between diastase and oleates, and oleates can therefore be removed from the diastase-oleate complex by the agency of corpuscles, leaving the diastase unchanged.
9. "Oleates can be completely recovered from the corpuscle-oleate complex by hemolysing the cells with distilled water, the oleate being then found in solution.
10. "Oleate-treated corpuscles are more readily hemolysed by most hemolytic agents than normal corpuscles.
11. "The same phenomenon was noticed in a few instances after treating corpuscles with sublytic concentrations of other hemolytic agents (e.g., saponin), but not in other cases (e.g., iodine).
12. "Cholesterin inhibits the hemolytic power of saponin, and the reaction between the two substances exhibits the quantitative characters of a chemical combination.
13. "The cholesterin-saponin reaction affords a method of estimating cholesterin in blood-serum or body fluids containing cholesterin associated with other lipoids.
14. "From a limited number of cases there appeared to be some indication of a lowered mean cholesterin content in the blood serum of syphilitics, but individual variations in cholesterin content of blood serum from the mean are too great to make this of any use in diagnosis."—C. G. B.

848. *Chemical Structure and Antigenic Specificity. A Comparison of the Crystalline Egg Albumin of the Hen and the Duck.* HENRY DRYSDALE DAKIN AND HENRY HALLETT DALE. *Bio-Chem. J.*, Liverp., 1919, 13, 248-257.

The authors find that the crystalline albumin from the hen and the duck behaved as distinct antigens in the anaphylactic reaction. "This difference corresponds to the difference in structure, as revealed by the fact, when the proteins are racemised, the amino acids escaping racemisation are not identical in the two tissues."—R. E. B.

849. *The Neutrophilic Granules of the Circulatory Blood in Health and in Disease—A Preliminary Report.* G. S. GRAHAM. *N. Y. State J. M.*, N. Y., 1920, 20, 46-55.

The author's conclusions are: "The application of abenzidine staining method to blood smears suggests that the neutrophils of the circulatory blood have a characteristic granule content that seems to vary, in health, only within relatively narrow limits. In acute infectious diseases, and possibly in some other toxic conditions, these granules may lose their reactivity towards benzidine to more or less marked degree. It is possible that the study of these granule changes may prove of interest through its bearing upon the general question of the leucocytic defensive mechanism and perhaps through its more immediate employment as a practical aid in clinical study of disease processes."—F. W. H.

## SERUM THERAPY

(See also Number 741)

850. *Potency of Antimeningococcic and Antipneumococcic Serums.* Anon. *Pub. Health Rep.*, Wash., 1919, 34, 2657-2664.

All antimeningococcic and antipneumococcic serums, before being released for interstate sale, must pass the official test at the Hygienic Laboratory. Antimeningococcic serums are considered satisfactory which show an agglutination titer or complement fixation titer against an antigen of each type, at least equal to that shown by the control serum furnished by the Hygienic Laboratory. Antipneumococcic serums are considered satisfactory which

show protection of at least as great a percentage of mice as are protected by the control serum furnished by the Hygienic Laboratory. The article gives complete directions for those tests as carried out at the Hygienic Laboratory.—C. E. T.

851. *Determination of Bacteriotropic Content of Antimeningococcic Serum.* ALICE C. EVANS. Pub. Health Rep., Wash., 1919, 34, 2375-2377.

As neither the phenomenon of agglutination nor of complement fixation appears to play a necessary part in the human defense against cerebrospinal meningitis, and as the invading organisms appear to be ingested by the leucocytes, a study of the phagocytosis-promoting bodies of antimeningococcic serum was made in order to develop a reliable test for such serums. It was found that the important phagocytic antibodies of the serum are not the labile opsonins which depend upon complement for their activity, but the more stable bacteriotropins. It was found that the resistance to phagocytosis cited by early workers is due to the existence of 4 well-defined groups of strains which are specific only with serum of the same group. There may be a weakening or loss of tropin-producing properties, or of ability to respond to specific tropins by strains after long artificial cultivation. A comparison was made of the agglutinin and tropin content of 128 commercial serums, and it was found that the two tests agreed in about 70 per cent of the serums. The tropin test has proved to be workable for the testing of antimeningococcic serums.—C. E. T.

852. *On the Preparation of Anti-toxin and its Associated Proteins From Heat Denaturated Sera.* ANNIE HOMER. Bio-Chem. J., Liverp., 1919, 13, 45-55.

"For the complete recovery of anti-toxin during the concentration of sera, showing a heat denaturation of 35 per cent more or less, by fractional method employing the use of ammonium sulphate it is advisable to precipitate the second fraction between 30 and 45 per cent of saturation with the sulphate. If the upper limit be reduced there will be incomplete precipitation of pseudoglobulin and anti-toxin, and a certain percentage of the latter will be discarded in the "albumin" filtrate. If the lower limit be raised then anti-toxin will be precipitated with the first fraction precipitate in a form not readily soluble in brine, and therefore to all intent and purposes lost."

"In the precipitation of the second fraction from sera in which a denaturation of 25 per cent or less has been induced, the raising of the lower limit to 33 or to 36 per cent of saturation leads to the production of clearer and more concentrated products than those obtained by the adoption of a lower limit of 30 per cent of saturation."

"In heated sera showing a denaturation of 35 per cent or less the bulk of the anti-toxin is associated with the protein precipitated between 36 and 45 per cent of saturation with ammonium sulphate."

Further studies of the protein isolated between the limits indicated above show that the percentage of total antitoxin precipitated between progressively increasing percentages of saturation with the sulphate is directly proportional to the percentage precipitation of protein at the respective stages.—R. E. B.

853. *On the Increased Precipitability of Pseudoglobulin and of its Associated Anti-Toxin from Heat Denaturated Solution.* ANNIE HOMER. Bio-Chem. J., Liverp., 1919, 13, 56-64.

"The increased precipitability of pseudoglobulin from a heat denaturated solution at concentrations of ammonium sulphate ranging from 26 to 47 per cent saturation is a function of the heat denaturation. The increased precipitation of pseudoglobulin thus induced at 30 per cent of saturation with ammonium sulphate is accompanied by an increased precipitation of anti-toxin. As denaturation increases so the further increased precipitability of protein becomes a measure of the increased precipitation of the anti-toxin."

"In the concentration of anti-toxic sera by the fractional precipitation of the serum with ammonium sulphate, there is no need for a preliminary prolonged heating of the serum. The results that are now obtained from the isolation from the heated serum of the protein fraction precipitated between 30 and 44 per cent of saturation with ammonium sulphate could be obtained from the unheated serum between 36 and 50 per cent of saturation with the sulphate."

"The heating of the serum reduces the toxicity of the cresylic acid-protein complex. Means other than fractional precipitation of the pseudoglobulin solutions by salt must be employed in any successful effort to isolate anti-toxin as a separate entity."—R. E. B.

854. *A Comparison Between the Precipitation of Anti-toxic Sera by Sodium Sulphate and by Ammonium Sulphate.* ANNIE HOMER. Bio-Chem. J., Liverp., 1919, 13, 278-295.

No critical point marked the limit for the precipitation of the individual proteins with sodium sulphate. Precipitation of serum proteins either by ammonium sulphate or sodium sulphate is influenced by the reaction, by the dilution of the plasma and by the addition of cresylic acid. "The percentage precipitation of the anti-toxins with the proteins precipitated at various concentrations of sodium sulphate is a linear measure of the percentage precipitation of the anti-toxin-bearing protein. This relationship is undisturbed by the denaturation of the serum proteins induced during the heating of plasma at 63 degrees for 45 hours."

"In the concentration of anti-toxic plasma by its fractional precipitation with sodium sulphate or ammonium sulphate, results can be obtained by the suitable fractionation of the unheated plasma similar to those which have hitherto been obtained with heated plasma. While the addition of cresylic acid materially aids the concentration of denaturated plasma, its use with unheated plasma is to be avoided."

"The agglutination of the particles of precipitated protein in the eu-pseudo-globulin zone seems to be more satisfactory with sodium sulphate than with ammonium sulphate. As sodium sulphate, in contradiction to ammonium sulphate, does not hydrolyze in solution, the sodium sulphate plasma antitoxin mixtures can be heated for four to five hours at 58° without loss of anti-toxin. This method of procedure favors the production of clearer end products than would result from conducting the heating in the two stages adopted in the ammonium sulphate method."—R. E. B.

855. *A Case of Septicaemic Anthrax Successfully Treated by Intravenous Serum Therapy.* E. N. BATEMAN AND N. H. FAIRLEY. *Med. J. Australia*, Sydney, 1920, 7th year, 1, 32.  
*B. anthracis* was isolated from the local lesion and from blood culture on the fifth day. On the fifth day, 40 cc. Sclavo's serum was administered subcutaneously, and on the sixth day, 40 cc. subcutaneously and 60 cc. intravenously. The following day the patient's condition was improved and he made an uninterrupted recovery.—C. P. B.

### ANAPHYLAXIS

856. *On the Distribution of the Non-protein Nitrogen in Cases of Anaphylaxis and Peptone Poisoning.* KAMBE HISANOBU. *Am. J. Physiol.*, Balt., 1919, 50, 357-363.

"Peptone intoxication is associated with a marked increase in urea nitrogen and also more or less in non-urea and amino nitrogen, thus confirming the results which have been reported by Whipple and Van Slyke. The changes in the nitrogenous constituents of the blood in anaphylaxis are similar to those of peptone intoxication but more intense. Anaphylaxis, as well as peptone intoxication lead to an abnormally rapid autodigestion of tissue protein. The causative factors, as yet undetermined, are probably the same in both cases."—R. E. B.

857. *Protein Fever. The Effect of Egg White Injection on the Dog.* SEYMOUR J. COHEN. *J. Lab. & Clin. M.*, St. Louis, 1920, 5, 285-294.

A report and discussion of the effect of repeated subcutaneous injection of egg white in guinea pigs and dogs. The experiments of Vaughan were confirmed in the case of guinea pigs but in dogs the temperature curve was not affected. At present the author has no explanation to offer as to the difference of reaction.—F. W. H.

858. *Leucocytes in Anaphylaxis of Serum Sickness.* JOSEPH H. BARACH. *J. Lab. & Clin. M.*, St. Louis, 1920, 5, 295-298.

At the time of the anaphylactic reaction there was a polymorphonuclear leucocytosis followed by the appearance of myelocytes and an increased number of blood platelets. Upon this a leucopenia followed accompanied by low polymorphonuclear and by relatively high mononuclear counts. Eosinophilia was absent throughout.—F. W. H.

859. *L'anafilassi passiva pel riconoscimento delle carni tubercolotiche. (Passive Anaphylaxis for the Recognition of Tuberculous Meat.)* L. GRANUCCI. *Clin. vet.*, Milano, 1919, 42, 115-126.

Muscle juice of cattle affected with tuberculosis in an advanced or medium degree, induces, when injected once into rabbits, a condition of hypersusceptibility, so that subsequent injection of tuberculin produces passive anaphylaxis of a grave character. Control rabbits injected with the muscle plasma of healthy cattle do not react or show but slight disturbance. In the anaphylactic reaction the animals show hyperthermia. (Abstr. in *Vet. Rev.*)—W. A. H.

### VACCINE THERAPY

(See also Number 615)

860. *Pitfalls in Determining the Prophylactic or Curative Value of Bacterial Vaccines.* G. W. MCCOR. *Pub. Health Rep.*, Wash., 1919, 34, 1193-1195.

The inadequacy of the evidence adduced to support the claims of various influenza and pneumonia vaccines put forth during the recent epidemic for prophylactic or curative use is very striking. The sources of error are chiefly: (1) the use of a vaccine among a group of individuals after cases of the disease have appeared, thus making it likely that only the naturally immune receive the vaccine; (2) vaccinating all persons in a group, leaving none as controls, and interpreting failure of the disease to appear or spread as evidence of protection, and (3) drawing conclusions from too meagre data. In the only examples with which the author was familiar in which a vaccine was used on alternate cases, no better results were secured in the vaccinated than in the control groups. The use of a vaccine should be properly controlled and sufficient time given for immunity to develop. The failure of one vaccine does not necessarily mean the uselessness of others.—C. E. T.

861. *Present Status of Pneumococcus Vaccine.* RUSSELL L. CECIL. Am. J. Pub. Health, Concord, 1919, 9, 589-592.

12,500 men (about 40 per cent of the total) were inoculated at Camp Upton with a polyvalent pneumococcus vaccine (Types I, II, III), most of the men receiving 3 or 4 inoculations at intervals of 5 to 7 days. Total dosage was 6 to 9 billion of Types I and II, and 4½ to 6 billion of Type III. Excepting a few small, sterile, infiltrations the reaction was generally mild. For the 10 weeks during which the men were under observation, the pneumonia death rate for vaccinated troops was 0.83 per 1000; for the unvaccinated it was 12.8. At Camp Wheeler a pneumococcus lipovaccine was employed (10 billion of each of the fixed types in 1 cc. of oil). Nearly one-half of the pneumonia occurring at the Camp was being caused by the fixed types. Of 13,460 men (80 per cent of the total), inoculated with the lipovaccine, 0.7 per cent gave a reaction sufficiently severe to require hospitalization. The results were somewhat complicated by the outbreak of influenza. The death rate for 155 cases of pneumonia among vaccinated men one week or more after vaccination was 12.2 per cent; the death rate of 327 cases among unvaccinated troops was 22.3 per cent. The death rate for primary pneumonia among vaccinated troops was 11.9; among unvaccinated troops, 31.8, almost three times as great.

Cecil discusses the present limitations of pneumococcus vaccination. No vaccine can, at present, be prepared against the organisms which make up Type IV. Polyvalent vaccines, to be efficacious, would have to be given in too large doses. It is difficult to get civilians to volunteer for vaccination. The severe reactions, fever, headache and backache and occasional sterile abscess (a total of about 100 in 14,000 vaccinated men) point to the great need for a detoxicated vaccine.—I. S. F.

862. *De la vaccination contre les états typhoïdes par la voie buccale. (Vaccination against the Typhoid Fever by the Buccal Route.)* A. BESREDKA. Ann. de l'Inst. Pasteur, Par., 1919, 33, 882-913.

From his experiences with typhoid infections during the war, Besredka questions the efficacy of the usual method of antityphoid vaccination by subcutaneous injections of killed bacteria. He saw numerous severe and fatal cases in thoroughly vaccinated soldiers, and at the same time noted the absence of typhoid infections in men who gave histories of earlier attacks of typhoid fever. The immunity produced by the usual vaccination is much inferior to that occurring after an attack of the disease.

As Besredka has shown, rabbits may be infected with typhoid or paratyphoid bacilli by mouth when the ingestion of the organism is preceded a day or less by a dose of bile. Ingested bile renders the intestinal mucosa susceptible to invasion by these bacteria. Rabbits which recover from such an infection acquire a high degree of immunity. The ingestion of dead typhoid bacilli, preceded by a dose of bile, also confers an immunity, though less effective than that produced when living organisms are used.

During the course of the immunization by the buccal route, agglutinins and protective antibodies appear in the serum of the animal. After two months or longer, these antibodies cannot be demonstrated in the serum, while the animal remains highly immune.

These experiments show that the presence of antibodies in the blood does not run parallel with the actual immunity of the animal. A condition of the tissues is apparently the basis of the immunity. In this case, the intestine is assumed to have acquired and retained an impermeability to typhoid organisms, as its expression of local vaccination. A general cellular immunity is also acquired, as the animal vaccinated by ingestion of bile and bacteria, survives intravenous injection of the organisms, which are fatal to unvaccinated animals.

The immunity following vaccination by mouth appears with rapidity (3 days).

It is suggested that the method be applied to man, using killed bacteria administered by mouth with doses of bile.—S. B-J.

863. *Effects of Typhoid Fever and Typhoid Vaccine on Pulmonary Tuberculosis.* E. E. CLOVIS AND G. E. MILLS. J. Am. M. Ass., Chicago, 1920, 74, 297.

When both diseases coexist typhoid vaccine gave severe reactions only in active cases and with no permanent bad effects. In cases of inactive tuberculosis typhoid fever exerts no detrimental effect on the pulmonary condition, while the general condition may often be benefited. In cases with active pulmonary tuberculosis associated with typhoid fever, patients recover without a more rapid advance of the pulmonary condition than if they had not had typhoid fever. Pulmonary tuberculosis has no appreciable effect on the course of typhoid fever.—P. G. H.

864. *Experiences with Vaccine in an Influenza Epidemic.* E. G. CARY. Proc. N. York Path. Soc., 1918, 18, 90-92.

A report of the results following the use of vaccines, both prophylactically and therapeutically, at General Hospital No. 1 during the influenza epidemic. An analysis is made of the data derived from two groups of corps men, one of which received inoculations with a commercial mixed vaccine (influenza bacilli, pneumococci, streptococci, staphylococci, *Micrococcus catarrhalis*, and Friedländer's bacillus); the other group received none. A somewhat higher percentage of incidence of the disease showed among the unvaccinated, but the records of admission showed that a sharp decrease in the rate of the epidemic occurred 48 hours after one series had been inoculated, and the epidemic had practically ended among

the corps men within the following four days. Therefore the author doubts if any real benefit was derived from the use of the vaccine among these men. In a series of nurses, one group was vaccinated with the same vaccine as used in the preceding series, while another group did not receive vaccine. The results on analysis would indicate that considerable benefit was derived from the vaccine—an incidence of 10.6 per cent occurred in the vaccinated, while the unvaccinated showed an incidence of 26.6 per cent. No deaths occurred among the vaccinated group. Actual pneumonia cases were treated by intravenous administration of vaccine (*B. influenzae*, pneumococcus I, II, and III, *Staphylococcus aureus*, and *Streptococcus hemolyticus*). The procedure of administration is given. Following an analysis of the results and a consideration of possible underlying factors, the writer felt that the treatment was of benefit in many cases.—L. W. F.

865. *Bactériothérapie préventive contre les complications de la grippe épidémique.* (Prophylactic Inoculation against Epidemic Grippe.) A. SALVAT NAVARRO. *Compt. rend. Soc. de biol.*, Par., 1919, 82, 832.

The vaccine consisted of *Diplococcus catarrhalis*, *Diplococcus crassus*, *Diplococcus mucosus*, the pneumococcus, and Gram-negative bacilli of the hemorrhagic septicemia group. The vaccine was killed by anesthetics instead of by heat. Two injections, 100 and 200 million, were given. Favorable results are reported although complete protection was not secured. In later work the dosage was increased and 4 injections (50, 100, 150, and 200 million) were given. The results on this last series have not yet been compiled.—G. H. S.

866. *Twenty Consecutive Cases of Influenza Treated by Mixed Vaccines.* G. H. PENNELL. *Guy's Hosp. Gaz.*, Lond., 1919, 33, 206-209.

A report of the results obtained by vaccine treatment as applied to cases of influenza during the "wave" of the epidemic in the months of February and March of this year. With few exceptions, the series of cases were treated exclusively with vaccines, although simple purgatives were given when necessary. The treatment was that advocated by Wynne, as published a short time before in the *Practitioner*. Pennell gives brief histories of his cases, with results, also charts, in so far as recorded, are submitted. In his summary, he expresses the opinion that "the vaccine has an effect on the pyrexia in all but the latest stages, and that if given early, before the pulse rate begins to rise, often aborts the attack," and "that the early use of the vaccine in several cases prevented the infection from obtaining a footing in the lungs." A mixed stock vaccine of *B. influenzae*, streptococci, pneumococci, etc., prepared according to Wynne's formula, was used. The doses used at first were those recommended by Wynne, but later they "gave much larger doses with confidence and happy results."—L. W. F.

867. *Zur Frage der Wirksamkeit des Ruhrschutzzimpfstoffes "Dysbakta" (Böhncke).* (The Efficacy of the Prophylactic Dysentery Vaccine "Dysbakta" (Böhncke).) K. SCHEER AND OBB. *Ztschr. f. Immunitätsforsch. u. exper. Therap.*, Jena, 1919, 28, 400-409.

"Dysbakta," a vaccine recommended by Böhncke as a prophylactic for dysentery, was administered by the authors of this paper to 10,000 soldiers. The authors are ignorant of the composition of this vaccine. Agglutinins for the Shiga and Flexner types of dysentery bacilli appeared in the sera of the men thus vaccinated. No increased protection against dysentery nor alteration of the course of the disease was apparent in the group of soldiers vaccinated with "dysbakta."—S. B.-J.

868. *Lipovaccines, with Special Reference to Public Health Work.* EUGENE R. WHITMORE. *Am. J. Pub. Health*, Concord, 1919, 9, 504-507.

A brief review of the literature and the development of "lipovaccine." The advantages over the ordinary saline vaccine are suggested. The entire amount of vaccine can be given at a single dose. Because the rate of absorption is considerably slower than that for the saline vaccine, the constitutional reaction is less severe. The immunity response is at least as good as with the saline vaccine. The vaccine does not deteriorate for at least a year. Since it is possible to give a very large dose of bacteria in an oil suspension, the vaccine may be prepared to be "polyvalent." Because of the slow rate of absorption, however, the lipovaccines although particularly well suited for protective inoculations are not suited for therapeutic use.—J. S. F.

869. *The Value of Bacterial Vaccines in Immunization and Therapy.* A. M. MOODY. *J. Am. M. Ass.*, Chicago, 1920, 74, 391.

A vaccine is not an emergency form of treatment and is not indicated in acute, generalized infections. Autovaccines are better than stock vaccines. Vaccines more than 4 months old should not be used. Vaccines should not be used to the exclusion of other medical treatment.—P. G. H.

## EXPERIMENTAL INFECTION

(See also Number 873)

870. *Experimental Study on the Mixed Injection of Bacillus influenzae and various Species of Cocci.* S. YANAGISAWA. *Kitasato Arch. Exper. M.*, 1919, 3, 85.

"The object of this work is to test to what extent the virulence for mice of *B. influenzae* and other bacteria may be enhanced by the simultaneous inoculation of two varieties.

"The general scheme of the experiments may be illustrated by that which deals with *B. influenzae* and '*Diplococcus catarrhalis*' (described as an atypical pneumococcus).

"1. Six mice were injected with 6 falling doses of *Diplococcus catarrhalis* to establish the minimal lethal dose.

"2. Six mice were injected with 3 falling doses of *B. influenzae* with the same object.

"3. Twelve mice in two series were injected with a fraction of the m. l. d. of *B. influenzae* and falling doses of *Diplococcus catarrhalis*.

"4. Twelve mice in two series were similarly injected with a constant dose of *Diplococcus catarrhalis* and falling doses of *B. influenzae*.

"Cultures were taken from the heart blood of the dead animals.

"From such an experiment it is concluded that:

"The toxic action of *Diploc. catarrhalis* is raised 10 times by the simultaneous injection of one-twentieth of the lethal dosis of *B. influenzae*."

"The toxic action of *B. influenzae* is raised eight times by the simultaneous injection of one-tenth of the lethal dosis of *Diploc. catarrhalis*."

"Similar experiments were performed with *B. influenzae* and pneumococci, streptococci, and staphylococci, with similar conclusions, but it should be noted that the pathogenicity of pneumococci and streptococci was so high for mice that the simultaneous injection of *B. influenzae* resulted only in an accelerated death. The author therefore bases his conclusions on the state of the animals after 24 hours when some were still alive.

"When *B. influenzae* was combined with pneumococci or streptococci, these latter bacteria were isolated alone after the death of the mouse, but when with *Diplococcus catarrhalis* or staphylococci, *B. influenzae* was also isolated.

"Further experiments combined *Diplococcus catarrhalis* with *B. dysenteriae* and with *B. paratyphosus*; also *B. influenzae* was combined with *B. dysenteriae*, but in none of these cases was any increase in pathogenicity found.

"The author thinks that in the epidemic pneumonia in man, *B. influenzae* first enters the respiratory system, and if any of the respiratory cocci obtain access, their pathogenicity is much increased by the presence of *B. influenzae*. Thus is produced the fatal disease. In such cases the secondary organisms only may be isolated from the patients." (P. F. in Med. Sci., Abs. & Rev., Lond., 1919, 1, 106.)

871. *Procédé pour rendre un lapin exclusivement tuberculeux pulmonaire. (Method for Securing Localized Pulmonary Tuberculosis in the Rabbit.)* E.-A. BOSSAN. Compt. rend. Soc. de biol., Par., 1920, 83, 7.

Localized pulmonary tuberculosis can be regularly secured by the injection of tubercle bacilli suspended in oil into the marginal vein of the ear. The oil circulates through the pulmonary capillaries very slowly and during the process the organisms are filtered out.—G. H. S.

872. *Beiträge zur Beeinflussung der Resistenz von Versuchstieren gegenüber Infektionskrankheiten. (Contributions on the Influence of the Resistance of Experimental Animals to Infectious Diseases.)* WALTER PFENNINGER. Centralbl. f. Bakteriol. (etc.), Jena. I. Abt., Orig., 1918, 80, 242-252.

Studied the effect of various chemicals and normal serum on the resistance of laboratory animals to artificial infection with anthrax, tetanus, and swine erysipelas. Some substances ( $\text{NaNO}_3$ ,  $\text{NaBr}$ ,  $\text{NaI}$ , Cymol) increased the resistance. Others (skatol and possibly  $\text{CuCl}_2$ ) decreased the resistance of the animal—M. L.

## CHEMOTHERAPY

(See also Numbers 756, 757)

873. *Observations on the Chemo-therapy of Bacterial Infections, with Special Reference to Experimental Pneumococcus Infection.* C. H. BROWNING AND R. GULBRANSEN. J. Path. & Bacteriol., 1919, 22, 265-269.

The authors report experiments on the protection of mice against pneumococcus infection with certain drugs, particularly diamino-acridine sulphate (proflavine). The mice were given, intraperitoneally, multiple lethal doses of pneumococci, and from 15 to 30 minutes later the drug was given also intraperitoneally.

In the case of proflavine, 1 cc. of a 1-600 watery solution per 20 grams of body weight was given. This procedure protected a fair percentage of the mice, while control animals died of pneumococcal septicemia within a few hours. In the opinion of the authors, the drug acted through co-operation with the natural defensive forces of the animal and not by a direct action upon the organisms. This conclusion is based upon the fact that larger but still sublethal quantities of the drug rendered the animals more susceptible to infection while smaller quantities apparently rendered the organisms more susceptible to the destructive forces of the animal or stimulated the tissues to greater activity. It is concluded that the results of their experiments justify the use of antiseptics in the treatment of localized bacterial infections.—C. G. B.

874. *Determination and Distribution of Arsenic in Certain Body Fluids after the Injection of Arsenobenzol, Salvarsan and Neosalvarsan.* C. N. MYERS. Pub. Health Rep., Wash., 1919, 34, 881-890.

The method, which is a modification of the Lockemann method, is applicable for the determination of small amounts of arsenic in organic material. It gives best results when applied to samples or aliquots containing 1 to 7 parts per million. The amount of arsenic found in body fluids was largest in the serum and least in the spinal fluid.—C. E. T.

875. *Action des colloïdes métalliques sur la staphylotoxine et la staphylolysine.* (The Action of Colloidal Metals on Staphylo toxin and Staphylo lysin.) LE FÈVRE DE ABBIC. Compt. rend. Soc. de biol., Par., 1919, 82, 1331.

Colloidal preparations of silver, gold, platinum, manganese and iron were tested. The potency of staphylo toxin was not altered by contact with the colloids of silver, gold, or platinum. The colloidal iron weakened the toxin, as did also to a greater degree the colloidal manganese. Colloidal silver increased the lytic action of the staphylo lysin, largely because of its own hemolytic action. A mixture of colloidal platinum and staphylo lysin is slightly less hemolytic than either component alone. Gold and iron caused little change, while the manganese markedly decreased the potency of the lysin.—G. H. S.

### PATENTS

876. *Fermentation Process for the Production of Acetone and Butyl Alcohol.* CHARLES WEIZMANN AND GEORGE ANTHONY HAMLYN. U. S. 1,329,214, March 27, 1918.

A process of producing acetone and butyl alcohol consisting of submitting a sterilized starchy mash to the action of molds having a strong proteolytic action and fermenting the mash by bacteria of the amylobacter group.—H. A. S.

877. *Apparatus for Sterilizing Liquids.* HARRY B. RUDD. U. S. 1,333,363, September 22, 1919.

An apparatus for sterilizing liquids by electricity.—H. A. S.

### MISCELLANEOUS

878. *Enterointoxication—Its Causes and Treatment.* ARCANGELO DISTASO AND JOHN HENRY FUGDEN. Bio-Chem. J., Liverp., 1919, 13, 153-163.

It was found that the presence of indoxyl, skatoxyl and ethereal sulphates in urine is coincident with an intestinal flora composed of microbes which *in vitro* produce indol and skatol. These substances disappear from the urine when the flora of the alimentary tract no longer contain organisms capable of producing indol and skatol.—R. E. B.

879. *Thyroïde et immunité acquise. Sur l'influence de la thyroïdectomie (chez le lapin) sur la formation de sensibilisatrices hétérohémostiques d'immunisation.* (The Thyroid and Acquired Immunity. The Effect of Thyroidectomy in the Rabbit on the Formation of Heterogeneous Amboceptor.) AMÉRICO GARIBALDI. Compt. rend. Soc. de biol., Par., 1920, 83, 15.

Thyroidectomy appeared to favor the development of anti-sheep amboceptor. Titration of the sera derived from those animals which had been operated upon showed an average titre of 0.007 cc., as compared with 0.012 cc. for similarly injected animals from which the thyroid had not been removed.—G. H. S.

880. *A propos du rôle de la thyroïde dans l'immunité.* (The Role of the Thyroid in Immunity.) L. LAUNOY AND LÉVY-BRUHL. Compt. rend. Soc. de biol., Par., 1920, 83, 90. Polemical.—G. H. S.

881. *Ueber die Bedeutung der Amidsubstanzen für die Ernährung der Wiederkäuer.* (The Significance of Amids in the Nutrition of Ruminants.) W. VÖLTZ. Ztschr. f. Spiritus-indust., 1919, 42, 223-224.

A study of utilization of the simplest amid, urea, by ruminants. Sheep and lambs were used for the test. The animals received urea in addition to chopped straw and molasses. The straw and molasses were so adjusted in amount that they were insufficient to meet the nitrogen needs of the animal. The conclusion was reached that urea is suitable for the replacement of digestible protein for grown ruminants. The larger amounts of nitrogen required by growing animals may also be secured from urea. It is concluded that the urea is utilized by the microorganisms of the digestive tract in the manufacture of bacterial protein and that the animal secures its nitrogen by the digestion of this protein. From 80 per cent to 90 per cent of the nitrogen of the dead bacterial cells is resorbed.—R. E. B.

882. *Untersuchungen über die Gewohnung an Gifte. I. Mitteilung: Das Wesen der Chininfestigkeit bei Protozoen.* (Studies on Acclimatization to Poison. I. Contribution: The Character of Quinine Resistance in Protozoa.) S. NEUSCHLOSZ. Arch. f. d. ges. Physiol., 1919, 176, 223-235.

*Paramecium caudatum* in general shows marked susceptibility to quinine. The threshold value of the lethal concentration is about 1:100,000. This concentration kills the paramecia in about two hours. By successive increases in the concentration it is possible to secure a high degree of resistance, on the part of paramecia, to the quinine. By the addition of very small amounts of  $\text{Na}_2\text{AsO}_3$ , amounts too small of themselves to be injurious, the quinine resistance of the paramecia is broken and the original susceptibility regained. The resistant paramecia possess the ability to destroy the quinine, an ability which is not possessed by the normal individuals. Arsenic which destroys the quinine resistance of paramecia, inhibits also the destruction of quinine by these organisms.—R. E. B.

883. *The Influence of Glandular Extracts upon the Contractile Vacuoles of Paramecium caudatum.* MARY DRUSILLA FLATHER. Biol. Bull., Bost., 1919, 37, 22-39.

Solutions of adrenalin, pituitary substance, and pineal gland tablets, produced an acceleration of pulse frequency within the contractile vacuoles of *Paramecium*. "It seems probable therefore that the stimulation of the vacuoles is produced entirely by the autocoid principles of the glandular extracts. It is questionable, however, whether the stimulation is produced directly by the action of these agents on the vacuole itself, or whether it is the indirect effect of increased metabolism in the entire organism."—R. E. B.





VOLUME IV

OCT 4 1920

NUMBER 3

# ABSTRACTS OF BACTERIOLOGY

UNDER THE EDITORIAL DIRECTION OF THE  
SOCIETY OF AMERICAN BACTERIOLOGISTS

JUNE, 1920

EDITOR

A. PARKER HITCHENS



*It is characteristic of Science and Progress that they continually  
open new fields to our vision.—PASTEUR*

PUBLISHED BI-MONTHLY  
FOR THE SOCIETY OF AMERICAN BACTERIOLOGISTS BY  
WILLIAMS & WILKINS COMPANY  
BALTIMORE, U. S. A.

THE CAMBRIDGE UNIVERSITY PRESS  
FETTER LANE, LONDON, E. C.

**Entered** as second-class matter April 30, 1917, at the Post Office at Baltimore, Maryland,  
under the Act of March 3, 1879

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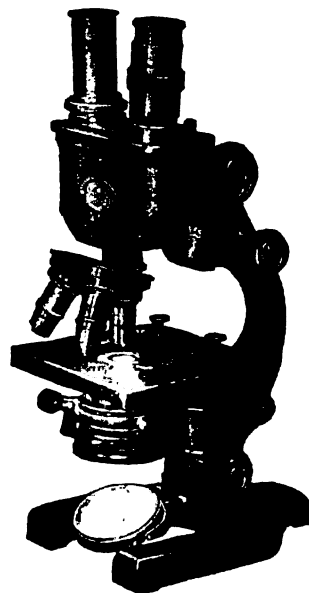
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## ABSTRACTS OF BACTERIOLOGICAL LITERATURE

### CHARACTERIZATION AND CLASSIFICATION

884. *Ueber den Klebs-Loefflerschen Bazillus. (The Klebs-Loeffler Bacillus.)* H. BERGSTRAND. Acta Oto-Laryngologica, Stockholm, 1918, 1, 131-186.

After having reviewed previous reports and theories concerning the morphology of the diphtheria bacillus and of other bacteria, the author discusses thoroughly his own findings obtained with 6 pure strains of diphtheria bacilli, isolated as single-cell cultures, and formulates his opinion regarding the systematic position of this organism. The relations existing between diphtheria and pseudodiphtheria bacilli are discussed in another chapter. A bibliography of 83 references and 6 plates are appended.

The author summarizes his results and conclusions as follows: The Klebs-Loeffler bacillus is no bacterium, but an organism to be classed among the *fungi imperfecti*. It seems to belong to the Mucedinaceae, especially to the Micronemeae, and appears somewhat similar to Monilia.

The so-called diphtheria bacilli are either sprouts ("Lang- und Kurzsporen") able to develop into budding mycelia, or hyphae showing true branching. The hyphae fragment into oidia; conidia formation by side branches seems also to occur.

Both short and plump as well as long and slender forms are normally produced by the diphtheria bacillus. They are always present simultaneously, though one may predominate in the smear. Pseudodiphtheria bacilli may assume the same shapes.

Only by its toxin formation can the diphtheria bacillus be recognized as a distinct species. A scientific diagnosis cannot depend on morphological details, but only on immunity reactions.

So-called involution forms, teratologic forms, etc., are normal types of growth of this organism, occurring on all substrates in young as well as in old cultures.

In old cultures, large globular, thick-walled, acid-fast forms may be found, which are called resting forms ("Dauerzellen"); they are related to the resting forms of yeasts, as well as to the spores of bacteria.

The club-shaped forms of the diphtheria bacillus are also to be considered as some sort of "Dauerzellen." The appearance of the barred types is due either to cell fragmentation or to plasma concentration. Babès-Ernst's granules are probably nuclei.

Investigations upon the variability of the diphtheria bacillus, as reported by Schmits and others, are not well founded, because they are based upon the erroneous hypothesis that the diphtheria bacillus has a constant typical bacillary form. The so-called variants are, however, normal stages in the life cycle of this organism.—F. L.

885. *Ueber sogenannte Corynebakterien und ihre Verwandten nebst Bemerkungen ueber Bakterien im allgemeinen. (So-called Corynebacteria and Related Organisms, with Remarks upon the Bacteria in General.)* H. BERGSTRAND. Acta Medica Scandinavica, 1919, 52, 1-94.

A corynebacterium isolated from a case of lymphoid leucemia, but of doubtful pathogenicity, was used for thorough morphological studies in single-cell cultures. It proved to be highly pleomorphic, growing as coccus, diplococcus, cocco-bacillus, bacillus, streptobacillus, branched threads, vibrio, spirillum, spirochete, and in fuso-bacillary shape. Gram staining was at first positive, later negative. Young cells showed active motility. Yeast-like budding and formation of spores by fragmentation, as with Actinomyces, were observed.

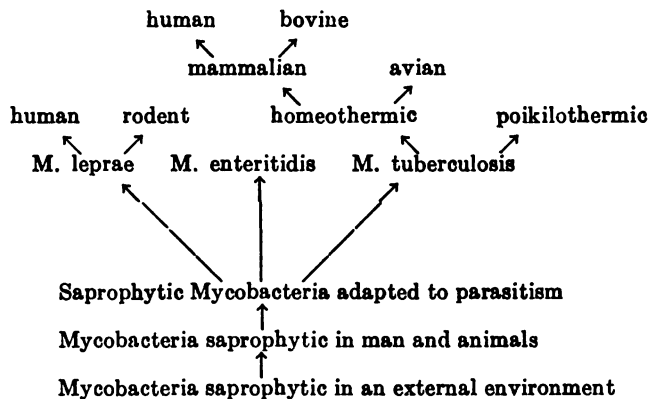
The author emphasizes correctly that the pleomorphism of all bacteria is much wider than is generally assumed. According to his opinion all bacteria are true fungi (Hyphomycetes). He discusses briefly the different groups of bacteria, and makes in this connection the statement that the spore-forming bacilli are not pleomorphic.

Results obtained with the causative agent of fuso-spirillary infections lead to the conclusion that in this case also a pleomorphic organism becomes active, appearing in fusiform as well as in spirochetoid shape.

A bibliography of 92 references and 4 plates is appended.—F. L.

886. *L'adaptation du parasite à l'hôte et son importance au point de vue de la pathologie et de l'épidémiologie. (The Adaptation of the Parasite to the Host and its Importance from the Point of View of Pathology and Epidemiology.)* B. GALLI-VALERIO. Schweiz. med. Wochenschr., Basel, 1920, 50, 143-148.

The importance of knowledge concerning the comparative pathology and epidemiology of disease among the lower animals in relation to human disease is emphasized. As an example of adaptation of certain groups of organisms, the Mycobacteria are illustrated as in the following scheme:



—G. H. S.

887. *The Isolation of an Organism Resembling the Paratyphoid Group.* ARNOLD DEAN. Med. J. Australia, Sydney, 1920, 7th year, 1, 27-31.

A bacillus having many of the characteristics of the para-colon group has been isolated from urine and feces. It is a Gram-negative bacillus, smaller than *B. typhosus*, motile. On agar and gelatin, clear, whitish, circular colonies, with slightly irregular margins, center granular. Gelatin not liquefied; does not ferment lactose nor dulcitol; produces gas in saccharose and raffinose; does not produce indol; produces acid in litmus milk on the 5th day, clotted on the 10th day and cleared on the 15th day; has agglutinating powers similar to *B. paratyphosus* B, is agglutinated by patient's serum; pathogenic for rabbits and guinea pigs. The association of the organism with a military hospital suggested the possibility of its having been brought to Australia by returned soldiers.—C. P. B.

888. *Sur un vibron pseudo-cholérique, Vibrio 150/151 Bacau.* (A Pseudo-cholera Vibrio, 150-151 Bacau.) D. MEZINCESCU. Compt. rend. Soc. de Biol., Par., 1920, 83, 164-166.

The vibrio was isolated from the stool of a patient presenting the clinical symptoms of cholera. No other cases of cholera occurred in the locality and the source of the infection remained obscure. Culturally and morphologically the organism resembled *V. cholerae* but it was inagglutinable with a cholera serum. The virulence was high and increased with subculture.—G. H. S.

889. *Studies on Pathogenic Anaerobes. I. Biology of Bacillus welchii.* BENJAMIN JABLONS. J. Lab. & Clin. M., St. Louis, 1920, 6, 374-383.

A description of the morphology, cultural characteristics, biochemical properties, serologic characteristics and pathogenic power of *Bacillus welchii*.—F. W. H.

890. *Beitrag zum Studium der die Saccharose invertierenden Bazillen: ein gasbildender.* (Contribution to the Study of the Bacilli Inverting Saccharose: a Gas Forming Bacillus.) M. G. MEZZADROLI. Ztschr. d. Vereins d. deutsch. Zuckerindust., Berl., 1919, Lief. 760, 250.

The author isolated a bacillus of the type of *B. coli* which transformed saccharose with the formation of the gases carbon dioxide, hydrogen, methane, etc. This organism can produce an alcoholic fermentation, the yield of alcohol amounting to as much as 20 per cent. The organism ferments glucose, lactose, mannose, mannite and coagulates milk. From 100 grams of sugar there is a yield of 2 to 8 grams of lactic acid, 2 to 6 grams of acetic acid, 0.5 to 1 gram of alcohol, and traces of acetone.—R. E. B.

891. *Cultural Studies of Species of Actinomycetes.* S. A. WAKSMAN. Soil Sci., Balt. 8, 1919, 71-213.

A large number of Actinomycetes isolated chiefly from soil have been studied culturally and biochemically, using a wide variety of media. The results are given in detail, following which there is a discussion of the following points: Utilization of carbon and nitrogen as sources of energy; the reaction of the medium; influence of temperature; production of enzymes. There is included a summary of comparative cultural data and a discussion of the variability of the Actinomycetes. The writer suggests a key for the identification of species. The summary tables include those on the utilization of different carbon and nitrogen compounds by Actinomycetes, the growth of Actinomycetes in milk, gelatin, agar and liquid media, a comparison on different media and the biochemical activities of Actinomycetes.

Several new species are described and the writer observes that differences in culture mentioned in the literature are often quantitative rather than qualitative due to the variations induced by composition, amount and form of inoculum, age of culture, etc. To this comprehensive paper is appended a bibliography of 47 references.—N. K.

## BACTERIAL NUTRITION AND METABOLISM

892. *Biochemistry of Bacillus acetoethylicum with Reference to the Formation of Acetone.* JOHN H. NORTROP, LAUREN H. ASHE AND JAMES K. SENIOR. J. Biol. Chem., Balt., 1919, 39, 1-21.

A new organism described as *Bacillus acetoethylicum* was isolated from potatoes. The organisms are short rods, do not produce chains, Gram-negative, motile and produce elliptical spores near the end of the rod, grow readily upon the ordinary culture media; on potato slants they produce gas bubbles all over the medium, the potato crumbles readily, milk is acidified and finally coagulated but not digested. The spores are sufficiently resistant so that they may be boiled at least 20 minutes. It is a facultative anaerobe and ferments the following sugars and related carbon compounds with production of both acetone and alcohol: galactose, maltose, mannose, raffinose, d-arabinose, starch, dextrin, dextrose, levulose, xylose and sucrose. Alcohol is produced from glycerol, but neither alcohol nor acetone from calcium lactate. The optimum temperature is about 43°C. The optimum reaction for the formation of acetone is between pH=6 and pH=7. Precipitated calcium carbonate was found to maintain a reaction at about this point. The optimum growth reaction, however, was between pH=8 and pH=9. The rate of formation of acetone and alcohol from potato starch was determined. The size of inoculation evidently had very little effect on the time required for the completion of the fermentation. A semi-continuous method of carrying on the fermentation was worked out.—R. E. B.

893. *The Reproduction of Aerobic Bacteria.* EDWARD C. HORT. J. Hyg., Cambridge, 1920, 18, 369.

Hort reports a series of observations, principally on *B. typhosus*, by which he aims to prove that bacteria multiply not only "by the simple process of transverse binary fission into two equal parts," but that "under certain circumstances the lower bacteria are able to reproduce themselves by the production of fertile branches and buds, and by endogenous production of gonidial bodies, in addition to the more familiar method of equal binary fission."

By using his methods of isolating single organisms Hort (J. Hyg., 1920, 18, 361) meets the objection that the aberrant forms in his cultures are not derived from a single organism and, therefore, cannot be contaminations, and also that these aberrant forms are still viable.

Hort gives a definition of involution forms of bacteria in the following language: "An involution form of bacterium can only mean a bacterium which is undergoing retrogressive, or perhaps, degenerative changes. It is, strictly speaking, a sterile organism which is not only incapable of maintaining its reproductive activity, but is also incapable of maintaining its integrity of form."

This definition is at variance with the usual conception of what is meant by the term involution form as it includes also what is commonly meant by the term degeneration form.

Hort studied *B. typhosus* in 4 per cent glucose broth, and 4 per cent glucose agar. In these media normal nutrition of the bacteria is disturbed, first, because of the high concentration of sugar, and second, the high acidity which soon develops in the medium.

Any opinion formed on the modes of reproduction of bacteria when placed under such abnormal conditions must be accepted with great caution.

Differences in the agglutinability of the "coccoid" forms of *B. typhosus* and the "bacillary" forms which developed on subculturing in broth indicate that the so-called "coccoid" forms may be masses of the cytoplasm of disrupted bacteria and that these masses no longer possess the property of being clumped when mixed with an agglutinating serum. It is also probable that the presence of high percentages of sugar and acid, in the cultures that were not agglutinated, interfered with the interaction of the agglutinin and the agglutinin which may have been present in the bacterial masses.

The agglutination results obtained with *B. typhosus* were duplicated with *B. dysenteriae* and with *Neisseria meningitidis*.

It is evident that any alteration of the osmotic tension of culture media will affect the normal process of fission, but these abnormal figures, which everyone has seen, should not be regarded as being modes of reproduction as Hort believes, but rather, abortive attempts of fission.—D. H. B.

894. *Zur Ernährungsphysiologie der Eisenbakterien.* (The Nutritional Physiology of the Iron Bacteria.) RUDOLF LIESKE. Centralbl. f. Bakteriologie (etc.), Jena. II. Abt., 1919, 49, 413-425. The author finds that the iron bacterium, *Leptothrix ochracea*, may be readily isolated by the use of manganese acetate agar of the following composition:

Distilled water.....	100.00 cc.
Agar agar.....	10.0 grams
Manganese acetate.....	0.1 gram

Contrary to the statements of Molisch, peptone is quite unnecessary for growth. This medium is not only suitable for isolation but for the succeeding growth of the organism. Colonies remain alive for at least 6 months on this medium. Growth shows up in 2 or 3 days at room temperature. The slender bacterial chains grow out through the medium, at first quite colorless and without any visible sheath. After a few days a sheath of precipitated manganese is definitely visible. After 8 to 14 days the individual colonies are brown.

The organism may be grown upon a variety of laboratory media. The medium must always be slightly alkaline as the organism will not develop in acid media. It was found possible to cultivate the organism in the pure inorganic solution, that is, one containing no carbon compounds other than carbonate.

The original contention of Winogradsky that the ions of iron or manganese are necessary for normal metabolism of this organism, is upheld, and the contention of Molisch disproved. The latter claimed that the precipitation of iron or manganese was a purely incidental matter. Whether or not Winogradsky's conception that the organism secured energy by the oxidation of iron and manganese from the "ous" to the "ic" condition requires further investigation. In pure inorganic nutrient solution the organism is able to assimilate carbon dioxide.—R. E. B.

895. *Observations on the Cultivation of Typhoid and Paratyphoid Bacilli from the Stools with Special Reference to the Brilliant Green Enrichment Method.* J. W. McLEOD. J. Hyg., Cambridge, 1919, 18, 260.

Dilutions of 1/250,000 and 1/500,000 of the dye in peptone water were used. The brilliant green enrichment method gives many more positive results than direct plating.—D. H. B.

896. *Sulla produzione da parte di alcuni batteri di acetilmethylcarbinol con differenti carboidrati. (The Production of Acetylmethylcarbinol by certain Bacteria with different Carbohydrates.)* M. SEGALÉ. Pathologica, Genova, 1919, 11, 495.

This investigation was undertaken to determine whether the Voges-Proskauer reaction could be utilized to differentiate certain closely related strains of bacteria. From the experimental results the author concludes: (1) the majority of pathogenic species studied do not form acetylmethylcarbinol with the series of sugars used; (2) in the intestinal group, data show that non-pathogenic vibrios give positive reactions; (3) with staphylococci, the method may show some differentiation, with a limited number of carbohydrates.—P. M.

897. *Su un terreno molto adatto per l'isolamento e le ordinarie culture del "Micrococcus gonorrhoeae."* (A Culture Medium Well Adapted for the Isolation and Ordinary Culture of "Micrococcus gonorrhoeae.") M. CARPANO. Ann. d'ig., Roma, 1919, 29, 599.

For the isolation and the maintenance of stock cultures of gonococcus the following culture medium has been found suitable: 2.5 per cent agar is added to peptone broth titrated neutral to phenolphthalein. The reaction is then adjusted by the addition of 4 per cent normal hydrochloric acid. To the solidified agar is added sterile defibrinated blood naturally hemolysed by aging according to details given. The gonococcus grown on the above culture medium retains its vitality and preserves its toxic and infective properties for a long time.—P. M.

898. *Weitere Versuche über das Kasein spaltende Vermögen von zur Gruppe Streptococcus lactis gehörenden Milchsäurebakterien. (Further Studies on the Casein Splitting Power of Lactic Acid Bacteria Belonging to the Group of Streptococcus lactis.)* CHR. BARTHEL AND E. SANDBERG. Centralbl. f. Bakteriologie (etc.), Jena. II. Abt., 1919, 49, 392-412.

The authors conclude that in studies of the split products of casein during cheese ripening the soluble nitrogen should be termed tyroalbumin nitrogen, peptone nitrogen and amino nitrogen, instead of the older terminologies. The ability of 22 new lactic coccus cultures, isolated from milk and starters, were studied as to their casein splitting power in milk containing calcium carbonate. After standing for 2 months, the amount of the soluble nitrogen formed for these various races, varied between 0 and 23.21 per cent of the total nitrogen. From a single milk sample 9 strains of lactic cocci were isolated with the ability to split casein between 11.25 and 23.56 per cent of the soluble nitrogen. The ability of a particular strain to split casein appears to be relatively constant upon transfer from one milk culture to another in the presence of chalk.

The degree of decomposition is independent of the concentration of soluble nitrogen, independent of the degree of dilution of the culture medium, but for a particular strain of the lactic cocci it constitutes an ability to develop a constant proportion of soluble nitrogen from a definite amount of casein. As previously shown by Orla Jensen, the growth of lactic cocci greatly increases the casein splitting power of rennet. This is true whether the lactic coccus of itself has the power to split casein or not. Studies are also reported on the part played by the lactic cocci in the ripening of cheese and the influence of the hydrogen ion concentration upon this ripening.—R. E. B.

899. *Action du streptocoque pathogène sur la caséine. (The Action of Pathogenic Streptococci on Casein.)* M. TISSIER AND A. DE COULON. Compt. rend. Soc. de biol., Par., 1920, 83, 110-111.

In studying certain strains of streptococci isolated from war wounds it had been noted that when they were inoculated into milk a coagulation, with retraction of the clot, and an apparent digestion of the casein followed. Further studies confirmed this observation and showed that the proteolytic action is enhanced by growth under anaerobic conditions.—G. H. S.

900. *Action du streptocoque pathogène sur la gélatine. (The Action of Pathogenic Streptococci on Gelatin.)* H. TISSIER AND Y. DE TRÉVISE. Compt. rend. Soc. de biol., Par., 1920, 83, 127.

Gelatin is liquefied by streptococci which are pathogenic. Saprophytic strains are inactive.—G. H. S.

## PHYSICAL CHEMISTRY

901. *Studies on the Action of Electrolytes on Bacteria. Part I. The Action of Monovalent and Divalent Salts on the Conductivity of Bacterial Emulsions.* C. SHEARER. J. Hyg., Cambridge, 1919, 18, 337.

The action of univalent and bivalent salts on bacteria in affecting the conductivity of thick emulsions of the meningococcus and *B. coli* demonstrates the important fact, that they lower the conductivity of these germs in the living condition, in a very definite manner. In this alteration, the predominant part is played by the cation.

All monovalent cations, with the exception of the H-ion, such as those of Na, K, Li, Rb, produce a rapid increase in conductivity or a fall in resistance. In its early stages this increase in conductivity is readily reversible in these solutions. If allowed to follow its due course, however, it leads finally to death in about two hours, when the bacterial cells no longer offer any resistance to the passage of the ions. The conductivity of the emulsion then becomes that of the fluid in which the emulsion has been suspended.

Bivalent cations and the H-ion, on the other hand, at first produce a slight fall in conductivity or an increase in resistance, followed, secondly, by an irreversible increase in conductivity which is slow and gradual resulting finally in death after 48 or more hours. This is shown by the cations of Ca, Sr, Ba, Cd.

In a balanced solution such as sea-water, blood plasma, Ringer's solution, van't Hoff's solution, where a certain quantity of CaCl<sub>2</sub> antagonizes a larger amount of NaCl and KCl, the conductivity of bacterial emulsions undergoes no change, but remains constant.

Dead, in distinction to living, bacteria offer little resistance to the passage of ions of a solution. It would seem the relatively high resistance of the bacterial cells is due to some conditions present in the living and absent in the dead state.

It has been shown by experiments on animals that the condition of increased conductivity of the cells is coupled with a loss of virulence in the case of some pathogenic bacteria. It is not clear from these experiments whether this is due to the actual death of the germs in a monovalent salt solution, or to a detoxicating action of these solutions on the germ. It would seem there is some evidence for believing that the latter takes place, as the lost lethal power returns in the presence of a small trace of Ca. In bivalent salt solutions no loss of toxicity takes place. It has been pointed out that the action of monovalent and bivalent salts on bacteria offers a new explanation of certain experiments with gas gangrene organisms, where it is at present considered that the action of the salts is on the tissues of the animal and not on the bacteria.—D. H. B.

902. *A Note on "Defence Rupture" and the Action of Electrolytes.* W. CRAMER AND W. E. GYM. J. Hyg., Cambridge, 1920, 18, 463.

The authors take exception to the conclusion reached by Shearer (J. Hyg., 18, 337) that their experiments indicated that the effects were brought about by an interaction of bivalent and monovalent ions on the normal stability of the cell wall.—D. H. B.

903. *Colorimetric Determination of Hydrogen-Ion Concentration without Buffer Mixtures, with Especial Reference to Soils.* L. J. GILLESPIE. Soil. Sci., Balt., 1920, 9, 115-136.

A simple technic is described for the preparation and use of a series of color standards for the colorimetric determination of hydrogen-ion exponent, no buffer mixtures being required and no increase in error recorded. Each color standard consists of two test tubes, one containing dilute alkali and the other dilute acid. The tubes contain altogether 10 drops of indicator solution, the ten being divided between the alkaline and acid tubes in various proportions. A table is given containing all the necessary data. A comprehensive theoretical discussion of the color changes, etc., is presented.

The indicators used are those selected by Clark and Lubs and the proper ranges noted. Soil extracts were prepared, water-clear, by the use of colloidal iron solution and the measurement of the hydrogen-ion exponents (9 soils) gave the same results as obtained by the usual methods. The use of colloidal iron for such work is not generally recommended without further study.—N. K.

904. *Ueber Seroscopie und einige Ergebnisse seroscopischer Beobachtung. (Seroscopy and the Results it Yields.)* H. DOLD. Deutsche med. Wehnschr., Berl. & Leipz., 1920, 46, 62-63. A discussion of some physical and chemical phenomena involved in serum changes.—B. C.

## BACTERIOLOGICAL TECHNIC

905. *The Cultivation of Aerobic Bacteria from Single Cells.* EDWARD C. HORT. J. Hyg., Cambridge, 1920, 18, 361.

The fragmented glass method, the squared coverslip method, the India ink method, Barber's method, and the droplet method of isolating a single organism are reviewed and the difficulties and defects of each method are explained. Hort describes two modifications of the droplet method, the one being controlled by examinations with the oil immersion lens, the other with a  $\frac{1}{4}$  inch lens.



A series of sterile coverslips is prepared, each with a small ring etched on one surface. A similar number of clean, sterile microscopic slides is also prepared. Over each slide is spread a thin film of peptone agar. The culture to be examined is diluted and a minute drop is placed in the etched circle of a coverslip. The inoculated coverslip is inverted on one of the slides, care being taken to insure direct application of slip to agar without sliding of the former over the latter. The droplet of inoculum must be so small that it does not extend beyond the rim of the circle when pressed down on the film of agar. The preparation is now examined to see that only one organism was transferred in the droplet. The slide is incubated at 37°C. for 4 to 6 hours. When the observer is satisfied that the colony in process of forming has started from the original cell, drawings should be started. After 12 to 18 hours' incubation the coverslip is removed with a sterile forceps and a subculture is made.

A second method described is the perforated plate method in which a  $\frac{1}{4}$  inch lens is used in checking isolation. This method differs from the first in that a perforated strip of thin celluloid is placed over a slide over which a thin film of inoculated agar is spread, and a sterile coverslip is placed over the celluloid. The coverslip protects the film from dust and also converts the cells into a moist chamber.—D. H. B.

906. *Caragheen als Nährboden für Bakterien und Pilze an Stelle von Agar.* (Caragheen as a Nutrient Medium for Bacteria and Fungi in Place of Agar.) R. LEHMANN. *Centralbl. f. Bakteriöl.* (etc.), Jena. II. Abt., 1919, 49, 425-426.

Caragheen, an extract of the alga *Chondrus crispus*, was found to be a satisfactory substitute for agar in the preparation of media both for bacteria and fungi.—R. E. B.

907. *Eine neue Methode zur Lösung und Verwendung von Eosin-Methylenblau.* (A New Method for Dissolving and Using Eosin-Methylene Blue.) KARL HOLLBORN. *Deutsche med. Wchnschr.*, Berl. & Leipz., 1920, 46, 77.

	Grams
Eosin-methylene blue.....	0.5
Ethyl alcohol.....	10.0
Glycerin.....	40.0

Warm to dissolve.—B. C.

908. *Nouvelle methode pour le recherche et la culture des anaerobies pouvant servir au diagnostic des affections causées par ces microbes.* (A New Method for the Study and Cultivation of Anaerobes Aiding in the Diagnosis of the Conditions Caused by these Microorganisms.) J. LIGNIÈRES. *Bull. Acad. de méd.*, Par., 1919, 82, 181-182.

The details of this method were published in *Compt. rend. Soc. de biol.*, October, 1919.—G. H. R.

909. *Nuevo metodo muy simple para cultivar facilmente los micobios anaerobios.* (A Very Simple New Method for the Cultivation of the Anaerobic Microorganisms.) JOSÉ LIGNIÈRES. *Rev. Zootec.*, Buenos Aires, 1919, 74, 932-935.

The author describes a new method for the cultivation of anaerobes and the use of a semi-fluid medium. He gives the composition of the new medium, the technic of cultivation, explains the theory of the action of oxygen on the anaerobes and places emphasis on the importance of the semi-fluid medium.—H. M.

910. *Ueber die Ursache des verschiedenen Steigvermögens der Bakterien in Filtrierpapier.* (The Cause of the Differing Capillary Rise of Bacteria in Filter Paper.) K. KLINGER. *München. med. Wchnschr.*, 1920, 67, 74.

The differences observed in the filterability of bacterial suspensions are explained as being due to alterations in the water attracting power of the cell wall. This lyophilic property may be reduced by addition of dilute electrolytes or by alcohol, and thus cause the cells to flock together or stick to the filtering elements.—B. C.

911. *Le laboratoire et le médecin militaire; manière de faire les prelevements et de les expedier.* (The Laboratory and Military Medicine; Method of Making and Shipping Specimens.) R. MARTIAL. *Rev. d'hyg.*, Par., 1917, 39, 161-191.

A semi-technical list of the procedures used in the diagnosis of the human diseases, and those common to man and other animals, e.g., anthrax, with brief mention of air and food methods. The matter included covers rather the general handling of materials, the details and the results needed for diagnosis being lacking.—J. B.

912. *A Device for Centrifugalization at Low Temperature.* WILLIAM H. WILKE. *J. Lab. & Clin. M.*, St. Louis, 1919, 5, 125-126.

A descriptive article with an illustration of the apparatus.—F. W. H.

913. *A Simple Laboratory Shaker.* E. J. WARNICK. *J. Lab. & Clin. M.*, St. Louis, 1919, 5, 128. An illustrated descriptive article.—F. W. H.

914. *Quick Method for Making Small Inner Tubes for Dunham's Fermentation Tubes.* EARL M. TAYLOR. *J. Lab. & Clin. M.*, St. Louis, 1919, 5, 128-129.

Description of a method of making these tubes from glass tubing.—F. W. H.

## FERMENTATION INDUSTRIES

(See also Number 892)

915. *Power Alcohol: Its Position and Prospects.* T. BAKER. Sci. & Indust., Australia, 1920, 2, 95-100.

Although the alcohol for power purposes is largely produced synthetically, the possibilities of its production by fermentation from various farm, plantation, and fruit crops is discussed; in the latter case, however, it is very aptly deemed a "parasite on the food supply". The author states that "if any great quantity of alcohol is to be produced here, the only material which will be available, without special cultivation, is wheat, for the reason that it is widely grown and may be preserved indefinitely in good condition without greater care than dryness and protection from rats, mice, and insect pests, while all root crops are available for a short portion of the year only, and, after maturity, rapidly deteriorate, even when carefully stored. The same applies to fruits."—Z. N. W.

916. *Macrozamia spiralis as a Source of Industrial Alcohol.* GEORGE HARPER. Sci. & Indust., Australia, 1919, 1, 470-475.

The possibility of using the bulbs of *Macrozamia spiralis*, the Zamia palm of New South Wales and Queensland, as a source of industrial alcohol is considered. The starch of the bulbs was subjected to acid hydrolysis, and the sugar resulting, subjected to alcoholic fermentation. Contrary to expectations, it was found that the outer part of the bulb in many cases yielded more alcohol than the inner portion. Bulbs from three different districts yielded quite widely varying amounts of alcohol; from Bateman's Bay district the percentage ran from 10.54 to 21.04 per cent; in the Wyong district, from 5.93 to 13.43 per cent, while in the Murwillumbah district the lowest percentages were found, from 0.70 to 4.97 per cent. From the point of view of alcohol production, the high fiber content of the bulb is a disadvantage since the solutions for fermentation must be considerably diluted with water in order to make it possible to work with them. Until some use can be found for the fiber, or it can be proved advantageous to completely hydrolyze it, the inner core is the most valuable as the source of alcohol.—Z. N. W.

917. *Vinegar.* ZAE NORTHRUP WYANT. Mich. Agric. Exper. Sta., Special Bull. 98, 27 pp., 1919.

A popular discussion of the rôle of bacteria and yeasts in alcoholic and acetic acid fermentations with directions for making vinegar. The use of pure culture starters is advocated and an offer is made to supply them at a nominal cost from the experiment station laboratory.—R. S. B.

918. *Cellulose; Fermentation of (for the Production of Acetic Acid).* POWER GAS CORPORATION, LTD., AND H. LANGWELL, Stockton-on-Tees. Eng. Pat. 134,265. 1.10.18, (Appl. 15,942/18).

A mash of cellulosic material, such as sulphite pulp or straw, is inoculated with fermenting vegetable matter, e.g., stable manure, and maintained under aerobic conditions at a temperature between 25° and 60°C. The cellulose undergoes acetic fermentation, and calcium carbonate or other suitable substance is added to neutralize the acid as it is produced. The mash must contain nutrient salts and nitrogenous matter, and some sugar or other readily fermentable substance may be added to induce a vigorous fermentation at the commencement. The temperature employed, within the limits stated above, influences the rate of fermentation, but not the yield of acid.—(J. H. L. in J. Soc. Chem. Ind., Lond., 1920, 39, 76a.)—E. B. F.

919. *Tiby.* M. KAYSER. Ann. des falsifications, Par., 1920, 13, 33-34.

Tiby, improperly called kephir, is described as an alcoholic beverage formed by inoculating an aqueous solution of sugar (50 to 60 grams of moist sugar to the liter) with a mixture of microorganisms. The organisms used are yeasts and one or two streptobacilli. These sometimes combine to form a glairy, gelatinous mass quite unlike kephir grains in appearance. The products of these microorganisms growing in a solution with proper sugar and mineral content are alcohol, CO<sub>2</sub> and lactic and acetic acids.—E. L.

## MYCOLOGY

(See also Numbers 1102, 1180)

920. *Ueber den Einfluss der Temperatur auf verschiedene Funktionen der Hefe.* (The Influence of Temperature on the Various Functions of Yeast.) HEINRICH ZIMM. Centralbl. f. Bakteriöl. (etc.), Jena. II. Abt., 1919, 49, 353-373.

A study was first reported on the influence of temperature on the vegetative growth. Some yeasts were found capable of multiplying at 2.5°C. This seemed to be about the minimum for these species. A few species have a maximum of about 42°C. Most species do not grow at either of these limits. The length of the average generation time was determined by the hanging drop method, the organisms being kept at temperatures varying from 9° to 40°C.

Two series were studied; one in which the organisms had been for some time grown at a low temperature, 8°C.; the other series in which the organisms had been grown at a higher temperature, 25°C. In general it was found that organisms which had become accustomed to growing at the lower temperature multiplied more rapidly at the lower temperatures than those which had been accustomed to the higher temperature. For example, an organism accustomed to growing at 25°C. required 17 hours and 31 minutes for a generation time at 12°C. One which had been accustomed to growing at 8°C. required 6 hours and 19 minutes for a generation. In most cases the smallest generation time occurred at about 30°C. The yeasts which had been accustomed to growing in the cold beer-wort apparently adapted themselves more quickly to higher temperatures than did yeasts growing at high temperatures adapt themselves to the lower. The minimum, optimum, and maximum temperatures for spore formation of 16 species of yeasts were determined. The optimum is about 25°C. The optimum, maximum and minimum temperatures for film formation of 6 species of yeasts and related organisms were studied. Marked variations were found among the different species. The temperature minimum for film formation appeared to be about 6°C., the maximum above 30°C., and occasionally considerably above this. *Monilia candida* produced film even at 37°C. Formation of fat from the yeast cells is markedly inhibited by temperatures under 12° to 15°C., but it is formed in large quantities in cells grown at 20° to 30°. The influence of temperature upon glycogen formation is also discussed.—R. E. B.

921. *Ueber Metabolin und Antibolin aus Hefe. (Metabolin and Antibolin from Yeast.)* E. VAHLEN. *Ztschr. f. Physiol. Chem., Strassb.*, 1919, 106, 133-177.

The author succeeded in preparing a metabolin and an antibolin from yeast, having the same general characteristics as similar substances previously isolated from the pancreas of the ox but not identical with these. One of these acts as a stimulant to fermentation, the other as a depressant.

It was again shown that these two substances could be transformed one into the other. A metabolin derivative was prepared from yeast which could no longer be transformed into antibolin. A similar irreversible metabolin derivative was prepared from potato.—R. E. B.

922. *Verstärkung der Katalasewirkung in Hefezellen. II. Mitteilung. (Increase in Catalase Activity in Yeast Cells. II. Contribution.)* HANS V. EULER AND INGVAR LAURIN. *Ztschr. f. Physiol. Chem., Strassb.*, 1919, 106, 312-316.

The activation of catalase action in top yeast by chloroform previously reported by Euler and Plix has also been demonstrated in *Saccharomyces thermantitonus*. On the other hand, this yeast does not show any activation by increase in temperature. The activation of the catalase is hypothetically attributed to a change in the colloidal condition of the enzyme molecule. Direct rays of sunlight quickly weaken the catalase contained in the living cell. An activation of such catalase by the sun's rays was never observed. Roentgen rays do not influence the catalase activity of living yeast.—R. E. B.

923. *Saccharasegehalt und Saccharasebildung in der Hefe. (Saccharase Content and Saccharase Formation in Yeast.)* H. V. EULER AND OLOF SVANBERG. *Ztschr. f. Physiol. Chem., Strassb.*, 1919, 106, 201-248.

The unit of ability to produce inversion per living cell of yeast is given by the equation

$$\text{Inversion Capacity} = \frac{K(\text{inversion constant}) \times \text{Grams of Saccharose}}{\text{Number of cells}}$$

This relationship remains quite uniform between the limits of 0.4 and 2 grams of yeast, 8 and 16 grams of cane sugar, in 100 cc. of solution. This inversion unit was determined for two yeasts. For one of the top yeasts studied it was  $10 \pm 2 \cdot 10^{-12}$ . For a bottom yeast it proved to be  $3 \pm 0.5 \cdot 10^{-12}$ . A table is included giving these results calculated for five other yeasts previously investigated. For the top yeast studied the temperature optimum for saccharase formation was between 26° and 30°C. Saccharase was no longer formed at 35°C.

Saccharase formation is markedly dependent upon the acidity of the solution. The maximum of enzyme production occurs at that acidity which is nearest the optimum for the activity of saccharase. The saccharase content of fresh living yeast is not changed by washing for many hours with tap water at a temperature of 10°.—R. E. B.

924. *Zur Kenntnis der Hefe Saccharomyces thermantitonus. (The Yeast Saccharomyces thermantitonus.)* HANS EULER AND INGVAR LAURIN. *Biochem. Ztschr., Berl.*, 1919, 97, 156-169.

A culture of *Saccharomyces thermantitonus* Johnson was studied with respect to its formation of enzymes, power of fermentation and its cell increase. The inversion capacity at optimum acidity is found to be  $5 \cdot 10^{-12}$ . For a bottom yeast the result was  $10 \pm 2 \cdot 10^{-12}$ , and for a top yeast  $3 \pm 0.5 \cdot 10^{-12}$ .

The catalase activity for the *Saccharomyces thermantitonus*, calculated for 0.1 gram dry weight, is  $K \cdot 10^4 = 73$ . For the yeast SB II it is  $K \cdot 10^4 = 114$ . Heat activation of the catalase action was not found in the thermantitonus yeast although activation occurred with toluol and chloroform.

The fermentative power at 35° is twice as great in *Saccharomyces thermantitonus* per unit of cell number as in the top yeast SB II. At 40° the power of fermentation is almost equivalent to that at 35°. The growth of the yeast shows a maximum between 35° and 40°.—R. E. B.

925. *Ueber Pilzkolonien mit spiraligem Wachstum.* (*Fungus Colonies with Spiral Growth.*)  
FRIEDRICH BOAS. Centralbl. f. Bakteriöl. (etc.), Jena. II. Abt., 1919, 49, 412.

A photograph is given of three colonies of *Oidium lactis* showing a definite spiral arrangement of growth. Similar spiral arrangements have been noted in *Penicillium brevicaulis* Sacc. and *Rhizopus nigricans*.—R. E. B.

926. *Action de la chloropicrine sur des moisissures diverses.* (*The Action of Chloropicrin on Various Fungi.*) LOUIS MATRUCHOT AND PIERRE SÉE. Compt. rend. Soc. de biol., Par., 1920, 83, 170-171.

The results are tabulated as follows:

	7 MINUTES	15 MINUTES	30 MINUTES	1 HOUR	3½ HOURS	5 HOURS, 40 MINUTES	8 HOURS
<i>Nocardia</i> .....	0	0	0	0	0	0	+
<i>Mucor</i> .....	0	0	0	0	+	+	+
<i>Penicillium</i> .....	0	0	0	0	0	0	+
<i>Amblyosporium</i> .....					0	0	+
<i>Hypomyces</i> .....	+	+	+	+	+	+	+
<i>Botrytis</i> .....	0	0	0	0	+	+	+
<i>Chaetomium</i> .....					0	0	+

"+" indicates that death of the organisms resulted from the exposure.—G. H. S.

## SOIL BACTERIOLOGY

(See also Number 898)

927. *Soil Biology.* J. MACKENNA. Rep. Prog. Agr., India, 1917-18, 101-103.

Field studies on the seasonal variation and effect of cropping and of fallow on soil nitrification showed that the presence of a crop, while diminishing the apparent amount of nitrification as measured by the nitrate found in the soil, actually increased the amount if it is assumed that the crop takes its nitrogen entirely as nitrate. Experiments on the specific nature of various strains of *B. radicicola* and upon apparent symbiotic fixation of nitrogen without nodule formation, in the case of inoculation with foreign strains, gave clear evidence of stimulation of growth as a result of nonsymbiotic nitrogen-fixation both by *azotobacter* and by nodule organisms. The practice of pitting and rotting a green-manure crop before applying it to the land has been found to give crops as good as those raised after green-manuring in the usual way.

Studies on the phosphate requirements of soil bacteria led to the conclusion that "increase in available phosphoric acid greatly increases the general bacterial activity of a soil, and therewith the formation of carbon dioxide." There is a positive relation between the amounts of carbon dioxide thus formed and the solubilization of phosphate in the soil, but this varies with the character of all the soils examined. Addition of phosphate in many cases diminished the nitrification rate, apparently owing to the disproportionate increase in non-nitrifying organisms. The final result over long periods of time in most cases showed no increase in the total nitrate formed. (Exp. Sta. Rec. 41, 720).—H. J. C.

928. *The Comparative Rate of Decomposition of Green and Cured Clover Tops in the Soil.* A. WHITTING AND W. R. SCHOONOVER. Soil Sci., Balt., 1920, 9, 137-149.

The experiment was conducted in parallel in the greenhouse and the laboratory on heavy brown silt loam. Curing retarded the rate of decomposition as measured by ammonification, nitrification and loss of carbon in both laboratory and greenhouse. The green clover produced nitrate very rapidly, more than doubling that of the cured clover.

Green and cured red clover underwent the same kind of decomposition under aerobic conditions but differed vastly when the oxygen supply was limited.

There was no measurable loss or gain of nitrogen during the experiment. The loss of carbon, and the change of the carbon-nitrogen ratios agreed with the other determinations in showing a difference in rate of decomposition between the green and cured clover, but did not indicate a difference in kind.

The change which dehydration (curing) brought about in the rate of the initial decomposition appears to be of a physical nature only. An explanatory hypothesis is that dehydration resulted in a hardening and shriveling of the tissues which interferes with the reentrance of water and consequently delays the decomposition because the bacteria must await the softening of the tissues before they are able to start their work, while with the green no such delay occurs, as the cells are already hydrated. Planting oats 3 days after treating the soil with green and cured clover resulted in serious injury with delayed growth. It was greater with the green clover.—N. K.

929. *The Formation of Nitrates in a Soil Following the Growth of Red Clover and of Timothy.* T. L. LYON, J. A. BIZZELL AND B. D. WILSON. Soil Sci., Balt., 1920, 9, 53-64.

Cylinders capable of being leached were filled with a soil of medium fertility and good drainage qualities and abundantly fertilized. Six cylinders were planted to timothy and six to red clover, all soils being inoculated with *B. radiculicola* from clover nodules.

There was little difference in the quantities of nitrogen leached from the timothy and clover soils during the growth of those crops. There was about six times as much nitrogen leached from the clover soil during the month that both soils stood fallow after removing both crops. There was only about twice as much nitrogen leached from the fallow clover soil as from the timothy soil during the next 5 months. At the end of this period the rate of nitrate production was greater in the clover than in the timothy soil. The crops of oats and maize following clover were likewise larger and contained more nitrogen.

The experiment taken as a whole shows that under the same conditions of soil and treatment, clover caused a greater production of available nitrogen than did timothy, although the data do not indicate whether this was due to a stimulation of the nitrification process or the contribution of easily nitrifiable material.—N. K.

930. *Das Problem der Stickstoffsbindung (Festlegung des Luftstickstoffes) bei niederen Pflanzen.* (The Problem of Nitrogen-gathering (Fixation of Atmospheric Nitrogen) by the Lower Plants.) H. FISCHER. Ber. d. deutsch. bot. Gessellsch., 1917, 423-454.

The writer obtains his results from the study of swamp soils. "The ability of a soil to produce protoplasm is what its nitrogen-fixing power guarantees, and vice versa." In this particular, the nitrogenous compounds of organic nature such as protein bodies should be especially effective. They must have a catalytic action on the hypothetical nitrogen-fixing enzymes. Phosphates act in the same way, from which fact the writer sees a suggestion that the bodies in question are to be sought in the group of nucleins.

The writer endeavors to support his opinion by letting pure cultures of *Chlamydomonas (tingens)* grow in inorganic, nitrogenous nutrient solutions and by inoculating these cultures with pure cultures of various bacteria. Nitrogen-fixation was observed only in a few cases, with bacteria of the Radiobacter group. The nitrogen-fixing *Bacillus asterosporus* (A. Meyer and Bredeman) did not grow under these conditions.

The writer then follows the Radiobacter group further in pure culture. These organisms are able to denitrify as well as to assimilate nitrate and fix nitrogen, doing the latter indeed only when sufficient albuminous solutions are employed, for example potato-water with 0.1 grams dipotassiumphosphate.

In cultures of *Chlamydomonas* plus impure cultures, strong nitrogen-fixation takes place, from which fact the writer concludes that dissimilation is important for nitrogen-fixation. (Rippel in Centralbl. f. Bakteriologie. (etc.), II. Abt. 49, 472.)—H. J. C.

931. *Beitrag zur Frage über die Bedeutung der freilebenden Stickstoff fixierenden Bodenbakterien für die Ernährung der höheren Pflanzen.* (Discussion of the Question as to the Significance of Free-Living Nitrogen-Fixing Soil Bacteria for the Nourishment of the Higher Plants.) M. DÜGGELI. Vierteljahrsschr. d. Natur. Gesellsch. Zürich., 1917, 62, 394-442.

Experiments are reported with heavy loam soil and different crops which showed that such soil, when fertilized with soluble phosphoric acid and potash but no nitrogen, contained much greater numbers of non-symbiotic, nitrogen-fixing bacteria than the same soil fertilized with sodium nitrate. In the latter, a greater number of denitrifying bacteria were found than in the former. It was also found that this soil when given full fertilization without nitrogen produced increasing crops after the third year without evidence of nitrogen deficiency. The results seem to indicate the value of non-symbiotic nitrogen-fixing bacteria in supplying available nitrogen to growing crops. The writer states, however, that further experiments on various soils with rotating crops, under different climatic conditions, will be necessary to show whether this is an exceptional case or is one of general application. He considers it better agricultural practice to obtain quick results by the application of farm manures than to submit the crops to nitrogen starvation for a time until eventually the nitrogen-fixing bacteria come into play. (Centralbl. f. Bakteriologie. (etc.), II. Abt. 49, 475, and Exp. Sta. Rec., 42, 18.)—H. J. C.

932. *Die Geisseln des Bacterium radiculicola (Beij.). The flagellation of Bacterium radiculicola Beijerinck.* CHR. BARTEL. Ztschr. f. Gärungsphys., 1917, 6, 13-17.

The writer tried, by means of a flagella stain proposed by Casares-Gil, to solve the still open question as to the flagellation of *Bacterium radiculicola*. He obtained the following result: The alfalfa and lupine nodules contain bacteria which show lophotrichic flagella, 1-6 at a pole, which often do not arise directly at the pole but slightly to one side. They are wavy, a fact which is not always evident in intensively stained preparations on account of the straightening out of the flagella which occurs. (Rippel in Centralbl. Bakteriologie. (etc.), II. Abt., 49, 471.)—H. J. C.

933. *Beitrag zur Frage der Nitrifikation des Stallmiststickstoffes in der Ackererde.* (Contribution to the Question of Stable Manure Nitrogen in Cultivated Soil.) CHARLES BARTEL. Centralbl. f. Bakteriologie. (etc.), Jena. II. Abt., 1919, 49, 382-392.

In studies of cultivated soil of different reactions maintained under specially favorable conditions for nitrate formation, it was developed that the nitrate nitrogen formed during

the first 4 to 5 months represented only a portion (never all) of the total amount of ammoniacal nitrogen of the fresh manure. In one and the same test series the percentage of nitrate nitrogen formed from the ammoniacal nitrogen of the manure is relatively constant and independent of the absolute amounts of manure added.

In soil in suitable culture but having decidedly acid reaction, nitrate formation may proceed at least as rapidly as in neutral soil. The fact that the nitrogen of ammonium sulphate is nitrified in acid soils as is organic nitrogen, was completely verified by the experiment. This is probably because the hydrogen ion concentration due to the nitrification of ammonium sulphate would be decidedly increased in such acid soils.—R. E. B.

934. *Beitrag zur Biologie der Harnstoff vergärenden Mikroorganismen, mit besonderer Berücksichtigung der Anaerobiose.* (A Study of the Biology of the Urea-Fermenting Microorganisms, with Special Attention to Anaerobiosis.) H. GEILINGER. *Centralbl. f. Bakteriologie* (etc.), II. Abt., Jena. 1917, 47, 245-301.

The writer describes a method of preserving liquid manure which has been found in practice to prevent almost all loss of nitrogen. As the most important feature in this method is the complete exclusion of oxygen, he raises the question whether its efficiency is due to the inability of urea-fermenting organisms to grow in the absence of oxygen or to the prevention of volatilization of the ammonia formed.

To test this matter the writer obtains 72 cultures of urea-fermenting organisms by "Anhäufungskultur" in urea-broth, inoculated with various samples of soil and manure. Eleven representative cultures are selected for careful study and comparison with previously described urea-fermenting bacteria, without much success in the way of identification of the writer's organisms.

Of the 72 cultures, 4 are able to ferment urea in the absence of oxygen. As there is no reason to assume that these anaerobic forms are rare, the writer concludes that the advantages of excluding air from the urine must be due to the retention of ammonia rather than to the prevention of growth of the urea organisms. He does not show, however, whether any of these anaerobic forms occur in the tanks of liquid manure in question.—H. J. C.

935. *Ueber Denitrifikation bei Gegenwart von Schwer zersetzlichen organischen Substanzen.* (Denitrification in the Presence of Difficultly Decomposable Organic Substances.) OTTO NOLTE. *Centralbl. Bakteriologie* (etc.), II. Abt., Jena. II. Abt., 1919, 49, 182-184.

The writer used the residue from quinine manufacture (chinarinde) in sandy soil for pot culture work with mustard. The crops were poor and were deficient in nitrogen. Analyses seemed to indicate that this was due to denitrification. Apparently the quinine residue, although very difficult to decompose, stimulates denitrification, presumably serving as a source of energy.—H. J. C.

936. *Ueber den periodischen Einfluss der Jahreszeit auf den Verlauf der Nitrifikation.* (The Periodical Influence of Season upon the Course of Nitrification.) O. LEMMERMANN AND L. WICHERS. *Centralbl. f. Bakteriologie* (etc.), Jena. II. Abt., 1920, 50, 1920, 33-43.

A discussion of possible periodical variations in soil bacteria due solely to season of the year, not to temperature, moisture or other factors. Previous work is taken up, showing that the earlier authors made no attempt to separate these factors. A comparison is given in this article of the plate counts and rate of nitrification in laboratory soil and field soil in an effort to separate these factors. There is some suggestion of a yearly period in the life activities of the soil organisms, but the writer states that these results, like those of other writers, are capable of being explained in other ways. If a direct influence of season can be established, one more unknown and uncontrollable factor will be added to the already large number which influence soil bacteriology.—H. J. C.

937. *The Isolation and Study of Nitrifying Bacteria.* W. M. GIBBS. *Soil Sci.*, Balt., 1919, 8, 427-482.

In this careful investigation, pure cultures of *Nitrosomonas* and *Nitrobacter* were isolated from soil and cultivated on artificial media. These developed readily on plates of washed agar or silicic acid gel; a discussion of improved methods is included. Pure cultures produced no visible growth when inoculated into bouillon. In using the latter test, 0.5 cc. of the culture must be used to give reliable results. Pure cultures of these organisms were maintained in liquid medium for an indefinite period of time.

The enrichment process can be continued for an indefinite period of time without the slightest loss of activity, the 52nd generation showing as great activity as any of the preceding. Neither the enrichment process nor the securing of "super-enrichment" cultures will yield a pure culture of *Nitrosomonas* or *Nitrobacter* without the use of suitable solid media. By careful manipulation the number of nitrifying organisms in the enrichment cultures can be increased from relatively few to a number greater than 10,000,000 per cubic centimeter of culture solution.

Soil extract used to prepare the nutrient solutions for the cultivation of these organisms did not prove toxic in either case. Sodium chloride in a concentration of 1.00 per cent was very toxic toward *Nitrosomonas*.

A critical discussion of the literature is of considerable interest.—N. K.

938. *The Protozoan Fauna of the Soils of New Jersey.* C. R. FELLERS AND F. E. ALLISON. Soil Sci., Balt., 1920, 9, 1-26.

Using soil extract, horse-dung and hay infusion as media, protozoa were found in all of the 33 New Jersey soils examined as well as in two Colorado and one Florida soil, the number of species from any one soil varying from 2 to 28. Poor sandy acid or forest soils contained the least number of species, while fertile soils rich in organic matter or with high water-holding capacity contained the greatest number. Of the 104 species identified, 51 were ciliates, 35 flagellates, 14 rhizopods and 4 heliozoa. In addition, 10 genera of algae and 6 of diatoms were identified.

Ciliates outnumbered flagellates in the number of species identified but not in actual numbers of organisms. It is believed that in normal New Jersey soils protozoa exist mainly in a non-trophic state, only two soils showing living protozoa. Therefore protozoa are of little importance from the standpoint of fertility in these soils. The soil microfauna consists principally of small, simple and hardy protozoa which are able to withstand adverse environmental conditions, and which are also found in the waters of the state.

The old "egg and germ" theory of the distribution of protozoa is replaced by a new theory here set forth, to the effect that multiplication takes place whenever there is excessive moisture present for a period of several hours, and that because of the fact that 24 hours are sufficient for the life cycle of protozoa, the whole cycle of many protozoa may be completed in the soil. There appears to be a definite soil fauna which differs from the surrounding fresh water fauna. Rich, fertile soils contain greater numbers of bacteria and protozoa than poor or very acid soils. Protozoa are to be generally found in field ditches, plow furrows, wet soil, etc.—N. K.

## DAIRY BACTERIOLOGY

(See also Number 898)

939. *The Value of the Methylene Blue Reduction Test as Compared with the Plate Method.* C. LIND. Milk Dealer, Milwaukee, 1920, 9, 24, 42.

The author summarizes as follows: "By the examination of 1600 samples of milk by the methylene blue reduction test, and the plate method, it has been found that the reduction test is reliable for the detection of poor milk, if by such is understood milk containing more than 500,000 organisms per cubic centimeter.

"The method will thereby prove to be a valuable means whereby milk plants can standardize their milk. If milk is received from a large number of patrons, it is the only practical method known.

"If the milk to be sold in the city is not pasteurized, the standard for No. 1 must be placed at 200,000 per cubic centimeter and in order to get within this standard it is necessary to use the plate method for the milk which has already been picked out by the use of the reduction test."—L. A. R.

940. *Über die Ursache der Entfärbung von Methylenblau bei der Reduktaseprobe.* (The Cause of the Decolorization of the Methylene Blue in the Reductase Test.) CHR. BARTEL. Molkerei-Ztg., Hildesheim, 1916, 30, 419.

Sterilized or heated milk is quickly decolorized in the reductase test. This is seen in milk in which the oxygen is removed by heating. The decolorization takes place very quickly at high temperatures and more slowly in proportion as the temperature is lower. Furthermore the time required for decolorization will be slower as the milk absorbs oxygen from the air.

This is also seen when the oxygen is washed out of the milk by a gas (hydrogen, carbon dioxide or nitrogen).

The decolorization begins at ordinary temperatures and goes on rapidly at 38° to 40°. This is equally true if the milk is heated or unheated, freshly milked or low in bacteria.

According to the investigations of the author the lactose and possibly other milk constituents are active.

Lactose in alkaline solution decolorizes and also reduces methylene blue.

The author found that this is also the case in neutral solutions when all of the molecular oxygen is removed in any way. Dextrose shows similar properties. The cause of the decolorization is explained therefore by the exhaustion of the dissolved oxygen of the milk, by the activity of the bacteria and the subsequent reduction by the lactose or other constituent of the milk. (Milchwirt. Zentbl., 1919, 43, 123.)—L. A. R.

941. *A Study of the Action of Bacteria on Milk Proteins.* GEORGE SPITZER AND H. M. WEETER. Proc. Ind. Acad. Sci., Indianapolis, 1917, 91-109.

*B. proteus*, *B. liquefaciens*, *B. subtilis* and *B. megatherium* when grown in milk used the diamino acid more rapidly than the monoamino acids. Milk cultures of various bacteria were held at room temperature and determinations made at 3-day intervals of the ammonia, amide nitrogen, lactose and acidity. Acidity was not in proportion to the gain in ammonia or loss in lactose. Since many cleavage products are formed simultaneously, acid and ammonia are not true measures of metabolism. Some of the bacteria using large amounts of lactose are also active in producing ammonia. *B. proteus*, *B. butyricus*, *B. mesentericus*, *Ps. fluorescens* and *B. coli* form proportionally larger amounts of acids than of ammonia and amids.—L. A. R.

943. *The Straining Cloth and Bacterial Contamination of Milk.* R. R. ASHWORTH. Milk Dealer, Milwaukee, 1920, 9, 50.

Plain agar plates, Endo plates and lactose bile broth dilutions were made from 100 square feet of strainer cloth shaken out in 100 cc. of physiological salt solution.

The highest results were 430,000,000 per cubic centimeter of which 600,000 were *B. coli*. The best result which was from a cloth properly washed and boiled, was 6,000 per cubic centimeter with no *B. coli* in 1 cc.—L. A. R.

943. *Gewinnung hygienisch einwandfreier Kindermilch. (Obtaining Hygienically Correct Baby Milk.)* ALFRED ROHLING. Molkerei-Ztg., Hildesheim, 1917, 31, 16.

Since children of the nursing age are frequently unable to retain or digest satisfactorily milk which has been pasteurized or otherwise freed from bacteria by high temperature, the author maintains that milk intended for babies should be produced by cows under veterinary supervision and as soon as possible after milking should be removed from the stable and filtered through a filter of the type used for removing bacteria from water, as for instance the Seitz water filter. In this way the pathogenic bacteria are removed from the milk.

If, later, before the milk reaches the child, it should become infected with bacteria this is of no disadvantage. The bacteria which should be guarded against are those which come from the stable (tubercle, anthrax, etc.).

Through touching toys, people, etc., and licking the fingers the child gets large numbers of bacteria into its mouth.

Since the filtered milk contains the important digestible material in unchanged form the child can retain and utilize it after proper dilution. (Milchwirt. Zentbl., 1919, 48, 129.)—L. A. R.

944. *Sterilization of Milk and Cream Without Imparting a Cooked Flavor.* G. WILSTER. Milk Dealer, Milwaukee, 1920, 9, 18-20.

A description is given of a Danish machine consisting of two connected coils of small pipes each enclosed in a cylinder. In the first cylinder the pipes are surrounded by steam so that the milk may be heated to any predetermined temperature. Water is circulated through the second cylinder which acts as a cooler.

The milk is circulated through the system by a force pump and a thermostatic valve returns to the supply tank any milk which is not heated to the desired temperature.

Milk heated to 248° to 266°F. had no cooked flavor and was found to be sterile.

Butter made from cream sterilized in this machine was not of better quality and did not keep any better than butter made from cream pasteurized in the usual way.—L. A. R.

945. *Die Gefahr der Ausbreitung der Tuberkulose unter den Schweinen infolge der Verfütterung nicht erhitzter Zentrifugenmolke. (The Danger of Spreading Tuberculosis by Fatting Swine with Unheated Separator Skim Milk.)* K. BURRI. Land. Jahr. Schweiz., Bern, 1915, 29, 315.

The author conducted an investigation to determine the virulence of *B. tuberculosis* in unpasteurized skim milk with special reference to the spreading of tuberculosis in swine. The source of most of the cases reported seemed to be in the skim milk returned unpasteurized from factories. Several small pigs were inoculated intraperitoneally with skim milk which had been previously heated to various temperatures before the inoculation. In all cases positive results were recorded with milk containing *B. tuberculosis*. Milk heated to 80°C. before inoculation into the experimental animals showed negative results.—G. J. H.

946. *Studies on the Formation of Gas in Sweetened Condensed Milk.* B. W. HAMMER. Iowa Agric. Exp. Sta., Research Bull. 54, 1919, 211-220.

"An outbreak of gas formation in sweetened condensed milk was studied and found to be due to a budding organism. Inoculation experiments, using normal cans of milk, prove the causal relationship of the organism to the condition studied." The organism is described and named *Torula lactis-condensi*. Yeasts capable of growing in 30 per cent solutions of sucrose were commonly found, but most of these were unable to grow in the sweetened condensed milk. A variation among brands of condensed milk was noted in their susceptibility to fermentation with the yeast studied.—R. S. B.

947. *The Volatile Acid Production of Starters and of Organisms Isolated from Them.* B. W. HAMMER AND D. E. BAILEY. Iowa Agric. Exp. Sta., Research Bull. 55, 1919, 223-246.

"1. In a number of starters, of very satisfactory quality and from different sources that were studied, more than one organism was present. This is evident from the following:

"a. Cultures of *Bact. lactis acidii* picked from agar plates poured with starter gave a much lower volatile acidity in milk than did the starter itself.

"b. By gradually diluting a starter a culture was secured which coagulated milk readily, but which yielded only a low volatile acidity that was essentially the same as the volatile acidity yielded by cultures of *Bact. lactis acidii* picked from agar plates.

"c. Two organisms were isolated from starters which in combination gave a volatile acidity approximating the volatile acidity secured from the starter, although each of these organisms alone gave a volatile acidity considerably below the volatile acidity produced by the starter.



"2. The high volatile acidity of starters is not due to the action of *Bact. lactis acidii* alone."—R. S. B.

948. *Zur Kenntnis der in reifem Emmentalerkäse vorherrschenden Bakterien.* (*Studies of the Organisms Present in the Ripening of Emmental Cheese.*) K. BURRI AND W. STAUB. Land. Jahr. Schweiz., Bern, 1915, 29, 626.

This report deals with the flora of Emmental cheese and its relation to the ripening. In an examination of numerous samples from different sources and in different stages of ripening, the authors found that the total number of organisms present varied from 10,000,000 to 100,000,000 per gram.

The predominant types in all stages were *Bacillus casei*  $\alpha$  and *B. casei*  $\delta$ . Although Freudenreich reported in an earlier work that *B. casei*  $\epsilon$  was the most abundant organism present in the ripening stages, the authors failed to corroborate his results. In a large number of examinations, *B. casei*  $\epsilon$  was found to be absent after the fifth month and present in only small numbers at the end of the third month. Cheese containing large numbers of *B. casei*  $\epsilon$  in the earlier stages were soon over-crowded with strains of *B. casei*  $\alpha$  and *B. casei*  $\delta$ .

The article concludes that *B. casei*  $\alpha$  plays the principal rôle in the ripening.—G. J. H.

949. *Aromabildner bei der Rahmsäuerung.* (*Aroma Production in Sour Cream.*) F. W. J. BOEKHOUT AND J. J. OTT DE VRIES. Centralbl. f. Bakteriöl. (etc.), Jena. II. Abt., 1919, 49, 373-382.

It has long been known that the *Streptococcus lacticus*, that is, the common lactic acid ferment, is not responsible for the development of the characteristic aroma in ripening cream and the consequent aroma of the butter manufactured from it. The authors have succeeded in isolating from soured milk and cream, having a desirable aroma, several strains of a streptococcus which, when associated with the lactic acid bacillus, gives rise to the desirable aroma. No specific name is given to the organism. It does not produce any visible change in milk. Morphologically it resembles the true lactic acid streptococcus very closely. When the two organisms are grown together in milk the characteristic desirable aroma is recognized. Dextrose, lactose and galactose serve as carbon sources. Dextrose is most favorable for growth. Ammonium sulphate, asparagin or urea cannot replace peptone in nutrient solutions. The only perceptible difference in milk, is that eventually milk inoculated with the associated organism has a somewhat sweeter taste. Evidence was secured showing that the organism has some power of inverting lactose to dextrose and galactose. A very small amount of acid is produced. Old cultures in milk, when heated to the boiling temperature, will coagulate. The coagulation is not due to the presence of acid. The inversion of lactose is most rapid at 31°C., and almost negligible at 20°. A lactase was proved to be present and was studied.

It is concluded that the characteristic aroma of properly soured milk is due to the action of the characteristic lactic acid bacteria upon the products of growth of the associated organism. This was shown by growing first the associated organism then the lactic acid organism in the same medium. The aroma did not develop when the reverse experiment was performed. It is concluded that the aroma is in some way associated with the presence of casein, inasmuch as it was not developed in its absence.—R. E. B.

950. *Microscopic Count of Bacteria. Its Value in Grading Pasteurized Milk.* PERCY WERNER, Jr. Hoard's Dairyman, Ft. Atkinson, 1920, 59, 988-990.

A popular discussion of the significance of bacteria in milk and the value of the direct microscopic count in determining the number of bacteria, particularly in pasteurized milk.—L. A. R.

951. *Farm Yard and Dairy Hygiene.* W. E. BURTON. Pub. Health, Lond., 1919, 33, 41-43.

A popular discussion of the problems of manure disposal, dairy construction, and milk control.—J. B.

952. *Ernährungserfolge mit spontan gesäuerter Milch.* (*Nutritional Results with Spontaneously Soured Milk.*) PROF. RIERSCHL. München. med. Wehnschr., 1920, 67, 35-36.

There is no chemical nor bacteriological support for the notion that spontaneously soured milk is harmful as a food. A number of children were fed this material, and they did not present a single disturbance referable to the souring of the milk. The author strongly believes that the dangers of decomposition of milk by saprophytic bacteria before consumption have been greatly overestimated as factors in the etiology and pathogenesis of nutritional and digestive disturbances during the nursing period.—B. C.

953. *Milking Machines and the Production of Clean Milk.* THOMAS ORR. Pub. Health, Lond., 1920, 33, 85-92.

A discussion of milking machines, their historical development, and a comparison of their mechanism and the advantages and disadvantages of milking machines, with a bibliography of some thirty titles.—J. B.

## COMPARATIVE PATHOLOGY

(See also Numbers 984, 1104, 1105)

954. *A Comparative Study of the Long Bones in Infectious Equine Anemia and other Conditions.*

L. H. WRIGHT. J. Am. Vet. M. Ass., Wash., 1920, 56, 444-447.

Many investigators of swamp-fever draw especial attention to the changes which occur in the long bones—the femur and humerus. The author attempts to show that the long bones in other diseases show changes almost, if not quite, identical with those found in swamp-fever.—W. A. B.

955. *Notes on Swamp-fever.* S. HADWEN. J. Am. Vet. M. Ass., Wash., 1920, 56, 439-443.

Parasitism and swamp-fever are clinically so much alike, differentiation is often difficult. Swamp-fever is frequently complicated with parasitic infestation. Work has been done which tends to show that internal parasites have no definite connection with swamp-fever.—W. A. B.

956. *Ricerche sull'aborto infettivo delle cavalle. (Researches on Infectious Abortion of Mares.)*

M. CARPANO. Ann. d'ig., Roma, 1919, 29, 752.

A bacteriological study was made of the etiology of the infectious abortion of mares. The author draws the following conclusions: (1) infectious abortion of mares is more prevalent in imported breeds, (2) young colts raised in surroundings where abortion prevails are often struck by polyarthritis; (3) such an infection is due to *B. abortus equi* belonging to the paratyphoid group. This organism is associated with a coccus of the type of *Streptococcus equi*; (4) infectious abortion of mares may be diagnosed by serum agglutination; (5) serum therapy with antistreptococcic polyvalent serum has proved very efficacious.—P. M.

957. *Piroplasmas, anaplasmas, y granulaciones cromaticas. (Piroplasma, Anaplasma, Chromatic Granules.)* JOSÉ LIGNIÈRES. Rev. Zootec., Buenos Aires, 1919, 6, 974-980.

The chromatic granules encountered in the acute anemia, natural or experimental, by their form, appearance, dimensions and characteristic histochemical properties, may be confused with the genus anaplasma. The inoculation of these granulations does not at any time give protective results; they do not confer immunity, are not of the nature of the parasite and are totally different from the anaplasmas. The type of reproduction of the latter is another important proof of its parasitic character. The piroplasma has the property of undergoing a retraction of the protoplasm which reduces considerably its volume and gives it a spherical form which resembles the anaplasma form. The regression can be even more intense if blood rich in *Piroplasma bigeminum*, is kept at a temperature approximately 5-8°C. They are then very small, regularly rounded and have the color reaction of nuclei; showing traces of protoplasm. These granulations may easily be taken for anaplasma, notwithstanding the fact that they are only evolution forms of the *Piroplasma bigeminum*, then when inoculated they reproduce piroplasmosis—never anaplasmosis. On the other hand, the animals that recover acquire always, 20-30 days after the inoculation of the pure anaplasma, a typical anaplasmosis; which is proof that they have not been vaccinated by the injection of the rounded form of the piroplasma.

The anaplasma then is not a phase of the evolution of the piroplasma; in order to be more convinced of this nothing is more indicative than the inoculation and study of the pure anaplasma in new cattle.

The work of Theiler has been confirmed fully by that of the author in the Argentine on *Anaplasma argentinum*. The specific relations of the anaplasma and its specific identity have been established. No immunity is conferred by anaplasma against piroplasma, and vice versa.—H. M.

958. *Contribucion al estudio de la anaplasmosis bovina "Tristeza." (Contribution to the Study of the Anaplasmosis in Cattle "Tristeza.")* JOSÉ LIGNIÈRES. Rev. zootec., Buenos Aires, 1920, 7, 24-35.

The experiences of the inoculation of "*Anaplasma argentinum*" in various species of animals are reported. The sheep and goat are most genuinely receptive. The guinea pig, rabbit, swine, and horse do not appear to be susceptible. The sheep and goat carry the organism in the blood in living form for several years. Sheep and goats inoculated may not even show the symptoms or lesions of anaplasmosis nor may the typical parasites be visible in the blood. Neither is the temperature altered except for about 30 days in which there may be a hyperpyrexia of 40° to 41°C. during one or two days only. Yet during this transitory fever when it exists, nothing in particular is observed in the animal and the color of the blood does not reveal the presence of the anaplasma clearly. The parasites nevertheless are there as the inoculations demonstrate but there is reason to believe that they are encountered in a form so small that it is difficult to recognize them. The blood of the sheep and goats which have been previously inoculated with the *Anaplasma argentinum*, is active when injected into the cows and these contract anaplasmosis. In a recent communication, the possibility of attenuating the parasite in the sheep and the employment of the blood as a vaccine against bovine anaplasmosis was suggested. It is also indicated with what ease the *Anaplasma argentinum* may be isolated by the inoculation of sheep.—H. M.

959. *Ensayos con el suero contra la fiebre aftosa (Loeffler). (Trial with Serum against Foot-and-mouth disease.)* F. ROSENBUSCH. An. Soc. rural argent., Buenos Aires, 1919, 53, 1009-1016.

An account is given of the use of the serum as a preventive at the National Livestock Exposition at Palermo in September, 1919. The serum injected in sufficient quantities was found to prevent the disease. It is advised to inject the serum on the spot, observing all of the measures of hygiene, disinfecting the cars and immediately isolating the first diseased animals. The dose should correspond to the body weight of the animal. The pens should be inspected daily, sick immediately isolated, the place disinfected and the neighboring animals injected with serum. Although the immunity generally lasts more than 15 days, it is best to reinject on that day in order to insure and prolong the resistance conferred. The serum injected at the full development of the disease, impresses a character of mildness and reduces in enormous proportions the complications. The preventive doses of serum for the Aberdeen-Angus and the Dutch vary between 40 and 80 cc.; those for the Short Horn and Hereford between 80 and 100 cc., under the conditions of the exposition. Parturition is a cause of lowering the resistance conferred by the serum and the animal should be freshly injected following labor. With small quantities of the serum it has been possible to avoid the death of calves. The infection of healthy bulls in the stable with the sick has been prevented by the injection of 50 cc. of the serum.

The application of the treatment to various conditions of the stock industry is discussed.—H. M.

960. *Investigaciones sobre sueros anticarbunclosos. (Investigations concerning Anti-anthrax Serum.)* SILVIA DESSY. Rev. Sud Americana de endocrinologia, 1919, 113. Abst. in Rev. zootec., Buenos Aires, 1919, 6, 985-986.

Concerns the discussion between Lignières and Kraus, with regard to the treatment of anthrax with the normal serum of the cow.—H. M.

961. *Diagnosis of Bovine Contagious Abortion.* C. P. FITCH. J. Am. Vet. M. Ass., Wash., 1920, 56, 459-467.

Based upon our present knowledge of the disease, the author believes that abortions are usually due to specific biological agents. The abortion and precipitation tests are thought to be of very little value, while the agglutination test is considered to be the most valuable of the serological methods of diagnosis, inasmuch as it will show the amount of herd infection but will not pick out individual aborters. Guinea pig inoculation is believed to be a reliable aid in determining the presence or absence of *Bact. abortum*.—W. A. B.

962. *The Bacteriology of the Reproductive Organs of the Cow and its Relation to that of the Meco-nium of the Calf.* WARD GILTNER AND S. G. BANDEEN. J. Am. Vet. M. Ass., Wash., 1920, 57, 46-57.

See this Volume, Abs. No. 41.

963. *Contagious Abortion in Cattle.* Editorial. Sci. & Indust., Australia, 1919, 1, 339.

This disease causes an estimated loss of from £250,000 to £500,000 annually in Victoria alone. Investigations are to be carried out along two lines which will be complementary. These are:—(1) to discover a method of raising the virulence of the contagious abortion bacillus, so that its immunizing power may be similarly raised; (2) to determine the effect of "sensitized" living cultures to discover (a) whether they will infect and so produce carriers or (b) whether they will set up an immunity without infecting, and so avoid the carrier risk.—Z. N. W.

964. *The Cattle Tick Sweeps Onward in Australia and Inflicts Heavy Losses. In the United States Tick is Being Driven Back.* Sci. & Indust., Australia, 1919, 1, 139-140.

Maps of Australia and of the United States are reproduced showing the tick-infested areas in each. In the United States the area which has been freed from the tick in the last ten years is also shown. A committee of experts in 1916 estimated that from tick-fever alone Queensland had suffered a monetary loss of at least £7,000,000. From loss of condition and consequent exposure to infection by other diseases, such as tuberculosis, as well as diminished milk production, the loss has been largely augmented. Large numbers of cattle have also died from tick infestation as distinct from tick fever and this pest has undoubtedly seriously affected the meat production of the country.—Z. N. W.

965. *Tema: Enfermadades del ganado lechero que pueden propagarse al hombre por la ingestion de productos de lecheria—Su profilaxis. (Diseases of Dairy Cattle which may be Transmitted to Man through the Ingestion of Dairy Products. Its Prophylaxis.)* CARLES MAS. Rev. zootec., Buenos Aires, 1920, 7, 35-45.

At the first congress of dairymen of continental South America the above paper was read indicating the possibility of the spread of bovine diseases to the human family by the use of dairy products, and urging the adoption of prophylactic measures and united action to meet the dangers existing. A number of the common diseases in question are discussed, par-

ticularly tuberculosis, anthrax, and foot-and-mouth disease with particular emphasis on the latter. It is suggested that an international congress be organized to study and combat this disease.—H. M.

966. *L'avortement épizootique au Congo Belge. (Epizootic Abortion in the Belgian Congo.)* RENÉ VAN SACEGHEM. *Compt. rend. Soc. de biol., Par.*, 1920, 83, 187-188.

The organism previously described by Bruynoghe (*Compt. rend. Soc. de biol., Par.*, 1919, 82, 88) is discussed.—G. H. S.

967. *Sobre la excreción de los bacilos tuberculosos por el intestino y por las vías biliares. (Concerning the Excretion of Tubercle Bacilli through the Intestine and the Bile Ducts.)* A. CALMETTE. *Rev. zootec., Buenos Aires*, 1919, 6, 951-955; and *Ann. de l'Inst. Pasteur, Par.*, 33.

The author reviews the literature on the subject of the excretion of microorganisms through the intestines, glands, blood, ducts, etc.

Frequently the bacilli are transported to the liver through the blood stream and eliminated then through the bile. The existence of the virulent organisms, frequently in large numbers, in the defecations, from this source, or from swallowed sputum, is a definite source of danger, and performs an important rôle in the dissemination of tuberculosis.—H. M.

968. *Coccidiosis in Cattle.* W. D. WAY AND W. A. HAGAN. *Cornell Vet., Ithaca*, 1920, 10, 17-27.

Only a few outbreaks of coccidiosis have been described in the United States, and the literature is scant. Most of the work has been done by European investigators.

The present article describes two outbreaks which occurred in November and December, 1919. Nine cases in all were observed, of which six recovered.

The gross lesions were confined to the cecum, colon and rectum. The lesions consisted of a thickening of the walls due to edema, and catarrh of the mucous membrane which was thrown into folds and was very greatly congested.

The microscopic lesions showed the same changes as the gross lesions. The intestinal glands over large areas were destroyed and their places filled with polymorphonuclear leucocytes and other wandering cells. Coccidia, the life cycle of which is given in detail, could be seen in their many different stages of development.

Treatment consists of a laxative, an intestinal disinfectant, an astringent enema, and a tonic. Care should be taken that the food and water supply is clean and plentiful.—C. M. C.

969. *Leukemia and Pseudo-Leukemia.* R. C. SPAULDING. *Cornell Vet., Ithaca*, 1920, 10, 28-33.

Leukemia is characterized by increase in white blood cells and decrease in red blood cells. In pseudo-leukemia there are no marked changes in the blood. In a clinic of about 15,000 dogs, 6 cases of leukemia and 7 of pseudo-leukemia have been observed in 3 years. These conditions were distributed among many breeds of dogs but the mongrel seemed to be affected most often. Sex and age appeared to have no influence on the disease.

The cause is unknown. Experimental transmission of the disease has failed. The symptoms of the two diseases are practically the same with the exception of the lack of the marked pathological blood picture in pseudo-leukemia. The most important clinical features are the enlarged lymph glands, the swellings usually appearing in the anterior regions first.

The disease is of a chronic nature and extends over a period of months. Diagnosis is easily made from the clinical appearance of the animal and from the laboratory examination of the blood. Treatment is of little avail and no cures are recorded.—C. M. C.

970. *Braxy: A Sheep Disease and Some Generalities.* W. J. DAKIN. *Sci. & Indust., Australia*, 1919, 1, 236-238.

This disease (if it is a true disease at all) appeared to resemble a sheep disease termed "braxy." The author, however, after making investigations wonders whether any one knows what braxy is. Some investigators seem to believe in the existence of a braxy bacillus but as this is only found after death, the connection of this organism with the disease as the causal agent is doubtful. It seems reasonable that a bacterium isolated at post mortem some hours after death should kill other sheep when inoculated subcutaneously. Dakin thinks braxy is little more than a name for a group of clinical and post mortem features due to more than one actual cause.—Z. N. W.

971. *The Longevity of the Virus of Hog Cholera.* H. C. H. KERNCAMP. *Cornell Vet., Ithaca*, 1920, 10, 1-7.

The purpose of the work described in this article was to determine how long the virus of hog cholera will remain virulent when preserved with 0.5 per cent phenol and 1 per cent glycerin and kept in a refrigerator at 45° F. in tightly corked and sealed bottles.

A fixed virus, which had been run through a number of generations and tested upon 8 to 30 or more susceptible pigs, was used. Two mls of the virus were injected into the medial surface of the ham.

Four groups of pigs were used with 2 to 5 of each group inoculated with a fresh virus. The latter served as checks.

The first group received virus ranging in age from 216 to 5 days. The second group received virus ranging in age from 162 to 9 days. The virus used on the third group was from 1038 to 38 days old; and in the fourth group the oldest virus used was 1161 days old.

The result of this work shows that the virus is not destroyed up to 1000 days, or approximately 3 years, if it has been carbolized and kept under low temperature conditions. However, virus more than 1100 days old does not appear to be infective.—C. M. C.

972. *La melitococia. (Malta Fever.)* VICTORIANA CALOMO. Rev. de hyg. y san. pecuar., Madrid, 1919, 9; and Rev. zootec., Buenos Aires, 1919, 6, 981.

Bacteriological studies have shown that Malta fever is an infectious disease of goats, transmissible to man, principally through the ingestion of raw milk. Some breeds of goats are more susceptible than others. To determine the foci of the disease in Spain is not a task for individuals but for the sanitary organization which the state has at hand. As in other infectious and contagious diseases, the practice of vaccination should be insisted upon.—H. M.

973. *Destruction of Rabbits by Disease.* Editorial. Sci. & Indust., Australia, 1919, 1, 205.

A subject that is the cause of much controversy and also of much opposition is that of controlling the rabbit by the introduction of some specific disease. Nothing of a practical nature in this direction has been attempted since the investigations of Danyz on an island off the New South Wales Coast many years ago. Aragao of Rio Janiero gives information of a disease of a very deadly nature that attacks only rabbits and hares. The horse, cow, sheep, dog, cat, fowl and pigeon are immune (pig not mentioned). Preliminary tests will probably be carried out on caged rabbits.—Z. N. W.

974. *Policia sanitaria—antecedentes y proyecto de legislacion en el Paraguay. (Sanitary Policy—Antecedents and Plan of Legislation in Paraguay.)* P. DE LA C. MENDOZA. Rev. Zootec., Buenos Aires, 1920, 7, 1-23.

The author discusses at length, the policy needed in Paraguay. He reviews the Argentine-Paraguay agreement on the interchange of cattle, the animal sanitary agreement of 1908, the sanitary policy initiated by the stockmen of Paraguay, the International Veterinary Conference at Montevideo in 1912, the Scientific Congress at Washington in 1916. The plan for the sanitary policy is outlined in detail and its necessity discussed.—H. M.

975. *Diseases Affecting Primary Production.* Editorial. Sci. & Indust., Australia, 1919, 1, 340.

The Primary Producers' Union, Sydney, points out that the problems requiring immediate attention are: contagious abortion, black-leg, and itch in horses; and in plant life, rust and other fungous diseases of wheat, and the eradication of noxious weeds, particularly St. John's wort.—Z. N. W.

976. *Applications of Veterinary Research.* H. A. WOODRUFF. Sci. & Indust., Australia, 1919, 1, 34-39; 117-119.

Australia is suffering immense losses in the stock industry which scientific research might mitigate or prevent. The geographical position of Australia has undoubtedly materially lessened the incoming of animal disease, for importation of animals has been expensive, and so has been confined to carefully nurtured and healthy pedigree stock. Furthermore, the time interval between the last port of call and the first Australian port exceeds the incubation period of nearly all the great animal plagues. Again, for many years now, effective quarantine has been a powerful factor in keeping out infective diseases. But perhaps the most important protection has been the freedom of the stock of Great Britain and Ireland from those animal plagues which have ravaged many other countries. Thus Australia is free from glanders, foot and mouth disease, rinderpest and rabies. Here it is stated that diseases of slow insidious origin, with a long incubation period are much more difficult to keep out than diseases of the types above named. Contagious abortion of cattle is mentioned as an example and the remainder of the article is descriptive of this disease, its economic importance, history, causal organism with its cultural characteristics and methods of cultivation, and biological tests for the presence of its specific antibodies.—Z. N. W.

977. *Huge Avoidable Losses.* J. A. GILRUTH. Sci. & Indust., Australia, 1919, 1, 213-219.

This article consists of observations on the introduction and spread of stock diseases and other "pests" with special reference to "cattle tick" and "worm nodules" and the loss sustained through the absence of early scientific control.—Z. N. W.

978. *La peste de las aves (pestis avium) en la Republica Argentina. (Fowl Plague in the Argentine Republic.)* ALEJANDRO ANDRIEU AND CARLOS H. BADANO. Rev. zootec., Buenos Aires, 1919, 6, 808-815.

The author discusses this infectious-contagious disease caused by a filterable virus and which attacks especially the domestic fowls. His personal investigations include the reproduction of the disease by various methods, a study of the dilutions of blood for inoculation to produce the infection, the conservation of the virus, and the effect of filtration and incu-

bation. The inoculation of the adult pigeon, the guinea pig, rabbit, sheep, cow and horse gave negative results. The goose, turkey, and adult ducks gave varying results. The hen is most susceptible. He also describes the symptoms, development and the lesions. The existence of the plague in the Argentine seems to be demonstrated.—H. M.

## PARASITIC DISEASES

(See also Number 1801)

979. *Culture de l'hématozoaire du paludisme. (Cultivation of the Malarial Parasite.)* M. CHAMBERLAND. Presse méd. Par., 1919, 27, 783.

Two modifications of the Bass and Johns technic are described; the first suitable for the maintenance of several generations in culture; the second merely permitting diagnostic multiplication to take place.

A. The freshly drawn malarial blood is centrifuged slowly, the serum and the layer of leucocytes removed with a capillary pipette, and replaced by an equal volume of warm solution of 0.075 per cent sodium citrate in 7 per cent saline (probably a misprint for 0.7 per cent). 50 per cent double-sterilized glucose solution is now added in the proportion of 0.15 cc. for each 5 cc. of whole blood. Mix and incubate at 37°. The parasites accumulate about 1 mm. below the red cell line, and may be withdrawn with a capillary pipette. Transplants should be made every 2 days to fresh, well-washed cells to which citrated saline and glucose are added as above. The addition of spleen or liver of the rabbit or guinea pig does not materially aid development. Spleen puncture material grows very well.

B. The second, more rapid method, does not permit of prolonged cultivation. Defibrinate the drawn blood by whipping in a test tube with a rod or wire (glass beads fracture the cells) add glucose as above, without decanting the serum; incubate and examine at the end of 12 to 15 hours.

*P. falciparum* grows well by these methods, and lives about 6 days, by method A. Occasional positive results are obtained when the direct smear is negative. Segmentation begins at 40 to 48 hours, and the merozoites need fresh cells, which are penetrated 24 hours later. Mitotic division may occur after 5 or 6 days. Merozoites of the third generation may be capable of infecting new cells, but will not develop.

*P. vivax* commences development, and gametes may even be formed, but death occurs on the second day. *P. malariae* does not develop.—L. A. K.

980. *Studies on Malaria Control.* C. C. Bass. Am. J. Pub. Health, Concord, 1920, 15, 216-221.

The cure of infected persons is an important factor in malaria control; its usefulness depends upon the extent to which it is carried out. If all persons who treat themselves and all who are treated by physicians took proper treatment and were disinfected, a reduction of 90.89 per cent in prevalence of the disease would take place within 3 years. By intensive survey and treatment it is theoretically possible to eradicate malaria entirely from any given region.—M. C. P.

981. *Ueber einige klinische Besonderheiten der Malaria. (Some clinical Characteristics of Malaria.)* HEINRICH SCHÄFER. Berl. klin. Wchnschr., 1920, 57, 62-63.

The prevalence of malaria in Germany is much greater than was suspected. The disease is often in a quiescent state so that the patient in whom it runs its atypical course is unaware of its presence. The demonstration of plasmodia in such cases can be made only after a provocative procedure.—B. C.

982. *Theorie und Praxis der Malaria-therapie und Prophylaxe. (Malaria Therapy and Prophylaxis.)* DR. HUNTEMÜLLER. Berl. klin. Wchnschr., 1920, 57, 58-62.

A general discussion of the epidemiology of malaria and of the curative and prophylactic measures that are applicable.—B. C.

983. *Zur Frage der Mischinfektionen mit Tropika und Tertiana. (Mixed Infections of Aestivo-Autumnal and Tertian Malaria.)* W. NOHER. Berl. klin. Wchnschr., 1920, 57, 83-85.

The maximal incidence of aestivo-autumnal malaria even in mixed infections occurs about a month later than that of the tertian type. The mixed infections run a more stubborn course than do all other forms of malaria. The majority of cases present possibilities for a double infection. The facts in a few cases might lend support to the theory of the transformation of parasitic varieties.—B. C.

984. *Malariaerfahrungen im Hochgebirge und Beobachtung eigenartiger Pigmentaustossung bei Plasmodium vivax. (Malaria in Mountains; Observations on a Unique Pigment Extrusion by Pl. vivax.)* DR. V. NBERGAARD. München. med. Wchnschr., 1920, 67, 155-159.

Dark field observation in numerous cases showed the extrusion and apparent motility of the so-called pigment granules of *Plasmodium vivax*. Mountainous climate influences favorably the secondary manifestations of malaria, but only slightly and indirectly the infection itself. Neosalvarsan causes a rapid disappearance of the plasmodia from the blood *in vivo*, though there is no such effect *in vitro*.—B. C.

985. *La trypanosomias humaine existe dans les forêts orientales du Pérou. (Human Trypanosomiasis Exists in the Eastern Forests of Peru.)* E. ESCOMEL. Bull. Soc. path. exot., Paris, 1919, 12, 723-726.

A man, 40 years old, applied for treatment for acute gonorrhea. He came from the tropical forest region of Peru, near the junction with Brazil and Bolivia, where he had had attacks of forest fever for a long time. The patient had mild fever; the skin was pale; the heart action was weak; and there was a hard edema over the entire body. The patient complained of great lassitude and an overwhelming desire to sleep.

The blood contained trypanosomes, 30 to 40 microns long and 3 to 4 microns in diameter. The nucleus was at the middle of the body; the blepharoplast was small and scarcely visible.

Escomel suggests that this is probably a case of infection with *Schizotrypanum cruzi*.—E. R. W.

986. *On Human Trypanosomiasis in Peru.* W. YORKE. Ann. Trop. M. & Parasitol., Liverpool, 1920, 13, 459-460.

Yorke discusses the trypanosome found by Escomel, and expresses the opinion that it is not *Schizotrypanum cruzi*, as it is larger than *S. cruzi*, and the blepharoplast is small. Yorke suggests the name *Trypanosoma escomeli* for the parasite.—E. R. W.

987. *Coincident Malaria and Enteric Fever.* H. H. SCOTT. Ann. Trop. M. & Parasitol., Liverpool, 1919, 13, 195-214.

The author discusses coincident typhoid and malaria, and reports 15 cases from Jamaica. He concludes that, in coincident typhoid and malaria, the course and severity of both diseases is modified, both diseases being milder. Quinine has no marked effect on uncomplicated typhoid; and the serum of uncomplicated malaria does not give a positive Widal.—E. R. W.

988. *An Observation on the Effect of Malaria in Leukemia.* J. W. S. MACFIE. Ann. Trop. M. & Parasitol., Liverpool, 1920, 13, 347-349.

Macfie reports the case of a boy with myelogenous leukemia and malaria. The treatment was intravenous injections of tartar emetic for the leukemia; and, when the malaria was found, quinine was given by mouth. The number of leucocytes was greatly reduced (from 326,250 to 62,900 per cubic millimeter) when malarial parasites appeared in the blood. The number of leucocytes increased to even more than they were at the first examination, when the malarial parasites were removed with quinine. Macfie has made the same observation in a case of lymphatic leukemia.

The tartar emetic had no beneficial action on the leukemia, and did not prevent the development of malaria.—E. R. W.

989. *On the Endemic Teutsugamushi Disease of Formosa.* J. HATOIR. Ann. Trop. M. & Parasitol., Liverpool, 1919, 13, 231-258.

The author has observed a number of cases of teutsugamushi disease in the eastern part of Formosa; he gives a map showing the endemic area. The infection is transmitted by the larva of the same mite, *Trombicula akamushi*, that transmits the infection in Japan. He discusses the distribution, etiology, diagnosis and treatment of the disease. Prophylaxis consists in preventing the mite from biting; cultivating infected areas; and educating the inhabitants of the infected areas.

The allied endemic fevers: pseudo-typhus in Deli, Sumatra; mossman fever in Australia; and cases reported from the Philippine Islands, Saigon, and the Federated Malay States have many points in common, and are probably due to the bite of mites.—E. R. W.

990. *The Experimental Infection in England of Anopheles plumbeus Stephens and Anopheles bifurcatus L., with Plasmodium vivax.* B. BLACKLOCK AND H. F. CARTER. Ann. Trop. M. & Parasitol., Liverpool, 1920, 13, 413-420.

Laboratory bred *A. plumbeus* were successfully infected with *P. vivax*. At 20°C., infections of both gut and salivary glands were obtained; at room temperature (maximum 26°C., minimum, 17°C.) gut infections only. Gut infection of *A. bifurcatus* was obtained at 28°C.—W. A. R.

991. *L'amibiase chronique en France; (étude clinique). (Chronic Amebiasis in France (A Clinical Study).)* E. CHARPIN. Thesis, Univ. Paris, 1919. Presse méd., Par., 1920, 28, 49.

A discussion of amebic dysentery in France, based on the study of 200 cases. About 50 per cent are atypical, including chiefly gastric, appendicular and rectal types. Mixed infection with *B. dysenteriae* is frequent. Stool examination and recto-sigmoidoscopy are the methods of diagnosis.—L. A. K.

992. *Ueber Darmamöben und Amöbenruhr in Deutschland. (Intestinal Amebas and Amebic Dysentery in Germany.)* WALTHER FISCHER. Berl. klin. Wehnschr., 1920, 57, 7-10.

A restatement of the problem of the relation of amebae to intestinal conditions in the host and of the interrelations of these organisms with the flagellates and other protozoa in cases of amebic dysentery.—B. C.

993. *Dissenteria amebica sul fronte Italiano. (Amebic Dysentery on the Italian Front.)* G. FRANCHINI. *Pathologica*, Genova, 1919, 11, 455.

The epidemiological, clinical, microscopic and therapeutic phases of amebic dysentery are discussed in detail.—P. M.

994. *Pathological Changes in the Gasterpod Liver Produced by Fluke Infection.* ERNEST CARROLL FAUST. *Johns Hopkins Hosp. Bull.*, Balt., 1920, 31, 79-84.

This study considers the normal metabolic processes of the host, the pathological changes caused by parasitism, and the application of these data to comparative pathology.—F. W. H.

995. *Ueber Trichocephalus dispar bei Nicht-Kriegsteilnehmern. (Prevalence of Trichocephalus dispar in Civilians.)* O. MOOG AND ELSE WÖRMER. *Berl. klin. Wchnschr.*, 1920, 57, 109-110.

Civilians showed 33 per cent infection with *Trichocephalus dispar* as against 46 per cent in the military. There were no untoward symptoms in the civilians that could be ascribed to the presence of the parasite.—B. C.

996. *Present Status of the Control of Dermacentor venustus Banks in the Bitter Root Valley, Montana, and New Data Concerning the Habits of the Tick.* R. R. PARKER. *J. Econom. Entomol.*, Concord, N. H., 1920, 13, 31-37.

The life history of the tick vector of Rocky Mountain Spotted Fever, and eradication measures were first worked out, and actual control initiated in 1912. The area of operation had been gradually extended until now it involves approximately 125,000 acres. Some measure of control is evidenced by the fact that considerable areas have been freed of the ticks and that there has been a considerable reduction in the number of cases.

Judgment as to permanency of results is limited by lack of knowledge as to the real source of the disease among wild mammals. Questions of the susceptibility, immunity, chronic infectivity, habitat, periodical variations in abundance and distribution, and the seasonal migrations and habits of these animals are all intimately involved.

The question of developing simpler and quicker methods of control is an important one. At present those employed are rodent destruction (directed particularly against the Columbian ground squirrel); the restriction of grazing; dipping and hand-picking the stock; quarantine and cultivation.

In spite of the study devoted to the habits of the tick accurate data are few, knowledge of larvae and nymphal habits especially being extremely meager. Observations recently made indicate that the ticks move about to a considerable extent and that the tendency when on a slope is to migrate downward, migration being hindered when the vegetation is at all abundant. Engorged immature ticks drop from their host during daylight, the rapidity of dropping depending upon the intensity of the light. These habits have a bearing upon the distribution of infected ticks and consequently upon the occurrence of infection in human beings.—W. A. R.

997. *Zur Frage der durch Eingeweidewürmer hervorgerufene Appendicitis. (Appendicitis Due to Intestinal Worms.)* W. KRIEGER. *München. med. Wchnschr.*, 1920, 67, 165.

A case of acute appendicitis is described which was due to the toxic and mechanical irritation caused by *Tenia saginata*.—B. C.

998. *Un cas de parasitation de l'homme par l'Hymenolepis diminuta (Rudolphi). (A Case of Human Infection with Hymenolepis diminuta (Rudolphi).)* L. GEDONLST. *Compt. rend. Soc. de biol., Par.*, 1920, 83, 190-192.

A case report. This is the fifteenth case of human infestation with this parasite to be recorded.—G. H. S.

## TROPICAL DISEASES

(See also Numbers 1014, 1015, 1044, 1193, 1194)

999. *The Mechanism of Spontaneous Elimination of Yellow Fever from Endemic Centers.* H. R. CARTER. *Ann. Trop. M. & Parasitol.*, 1920, 13, 299-311.

Towns in the tropics free themselves from yellow fever, without sanitary work directed towards control of Stegomyia. This is evidenced by many instances of non-immunes living in the community so as to be exposed to yellow fever if it exists and yet not developing it.

The conditions for the continued existence of yellow fever in a community are there; the carriers, active *Stegomyia calopis*, and susceptible men; all present at the same time, the insects having access to both classes.

A tropical community in which yellow fever is present, Stegomyia abundant, and active at all seasons, will in time have no people susceptible to yellow fever left, unless there is an introduction of such people. Yellow fever would then disappear or even, indeed, before there were no susceptible people left, since by the law of chance there would be no non-immunes left fulfilling the conditions of time and place essential, before there were absolutely none at all.



An immigration of susceptible people, either from some other place or by birth is then necessary for the continuation of yellow fever in a community and if this immigration fails, or fails to fulfill certain conditions, yellow fever disappears. As is to be expected, it is the small and moderate sized towns receiving little immigration which will free themselves of the disease. The author believes that it is the rule for yellow fever to disappear completely from such communities, without sanitary work or diminution of *Stegomyia*.

It is well emphasized that for a town which has freed itself from yellow fever by the failure of the human host to remain permanently free, isolation from infected places is necessary. When the disease has been eliminated by the control of the insect host this isolation is not necessary as long as the control continues to be efficient.—W. A. R.

1000. *Gelbfieber, die neueste Spirochätenkrankheit. (Yellow Fever, the Newest Spirochetal Disease.)* W. H. HOFFMANN. Deutsche med. Wehnschr., Berl. & Leipz., 1920, 46, 174-176.

The epidemiological evidence of Finlay and of Gorgas in America, and the subsequent demonstration by Noguchi of the etiological agent in yellow fever are discussed.—B. C.

1001. *A Case of Chronic Abscess Caused by a Nocardia.* A. PLJPER. Med. J. S. Africa, Johannesburg., 1919, 15, 82-83.

On two different occasions (interval of a year) the same microorganism was isolated from a lesion. When injected into animals subcutaneously abscesses were produced and caused death when injected intraperitoneally.

The organism grew best on glycerin agar, colonies were dull, dry and wartlike, of grey color changing to brown and adhered to the medium.

On milk, gelatin, potato and Sabouraud's medium there was no growth; on broth, and glucose, saccharose, lactose and maltose broth there was good growth which sank to the bottom leaving supernatant fluid clear.

Microscopic examination shows long filaments, some branching; granules could be seen at certain stages. Neither filaments nor granules were acid fast.

This organism corresponds to that described by Chalmers and Christopherson as *Nocardia foulertoni*.—C. P. B.

1002. *Recent Work on Tropical Diseases.* R. TANNER HEWLETT. Practitioner, Lond., 1920, 154, 210-219.

A résumé of the most recent work on this subject, with a valuable bibliography.—C. P. B.

## MEDICAL ENTOMOLOGY

(See also Numbers 1037, 1184)

1003. *New Mosquitoes from Panama.* C. S. LUDLOW. Psyche, Bost., 1919, 26, 166-169.

Description of *Anopheles (Stethomyia?) miveopalpis* and of *Trichoprosopon (Joblotia) shropshirei*, both from the Canal Zone.—W. A. R.

1004. *Observations on Anopheles (Coelodiazesis) plumbeus Stephens, with special Reference to its Breeding Places, Occurrence in the Liverpool District, and Possible Connection with the Spread of Malaria.* B. BLACKLOCK and H. F. CARTER. Ann. Trop. M. & Parasitol., Liverpool., 1920, 13, 421-452.

Though *Anopheles plumbeus* is very widely distributed, being found in nearly all the European countries, and in the Western Himalayas, the bionomics of the species are probably less known than those of any European anopheline mosquito.

It is generally considered to be essentially sylvan and to occur but rarely in houses. This reputation is due chiefly to the fact that the females retire to the shelter of their breeding places shortly after feeding. They bite readily day or night. The maximum length of life of females which received one meal of blood and had free access to moistened raisins was 75 days.

*A. plumbeus* and related species are essentially tree-hole breeders, their larvae developing in water contained in rotholes. The species of tree seems only of importance from its tendency to form suitable breeding places. The larvae were found in isolated trees as well as in forests and woods.

The movements of the larvae and their habit of living mainly at the surface of the water appear to be typically anopheline. Young larvae were found on numerous occasions in December, January, and February, and can revive after water in which they live has been frozen solid for short periods.

Though no intensive surveys have been made, the authors found the larvae in every locality which they searched, and believe the species is widely and commonly distributed throughout the British Isles. They had previously demonstrated its ability to carry malaria, but "far more detailed information regarding its bionomics and distribution is required before any definite statements can be made" regarding its importance as a natural carrier of the disease.—W. A. R.

1005. *Notes on the Bionomics of Stegomyia fasciata* Fabr. J. W. FIELDING. Ann. Trop. M. & Parasitol., Liverp., 1920, 13, 259-296.

The average egg production of a fertilized captive female fed on blood was 750, covering a laying period of from 40 to 72 days. Females have been kept in captivity up to a maximum of 93 days. Contrary to Bacot, the author found that *Stegomyia* do not appear to show a preference for certain rooms or situations, but will oviposit in almost any receptacle containing water.

A series of experiments confirmed the conclusions of previous workers that eggs of *Stegomyia fasciata* are capable of withstanding long periods of desiccation. Thus, 25 eggs laid over night were placed in a petri dish 3 inches in diameter, containing 10 cc. of tap water which was replaced as often as it evaporated. After 10 dryings and 10 replacings of the water, all of the eggs hatched in 34 days. One batch of eggs remained viable in dry storage for 257 days, a period very close to Bacot's maximum of 262 days.

Eggs which had been dried and resisted subsequent immersion were in considerable percentages stimulated to hatching by periods of cooling ranging from 2 to 48 hours, by immersion in lysol, and in 2.5 per cent soap solution. Larvae seemed uninfluenced in development by the presence or absence of light. Subjected to a temperature of 98.6° F. for some days recently hatched larvae failed to complete development. Heated over a water bath the approximate maximum temperature that larvae and pupae could withstand without great mortality was 105° F.

In experiments to ascertain whether *Stegomyia fasciata* would lay eggs when fed food other than blood, it was found that when concentrated peptone and sugar solution was given as food eggs were laid, about 60 per cent of which were fertile. In experiments with sugar alone, with banana, syrup, honey, dates, apple, etc., there was no egg production.—W. A. R.

1006. *The Chaetotaxy of the Pupa of Stegomyia fasciata*. J. W. S. MACFIE. Bull. Entomol. Research, Lond., 1920, 10, 161-169.

The pupa of *Stegomyia fasciata* is furnished with 200 setae, the position and grouping of which are described in great detail, but without obvious profit.—W. A. R.

1007. *Witterung und Stechmückenpflege. Eine biologische Studie. (Weather and Mosquitoes.)* ECKSTEIN. Ztschr. f. ang. Entomol., Berl., 1919, 6, 93-105.

All of our mosquitoes have a resting period in the winter regardless of the stage in which they hibernate. The adults do not feed, the larvae do not increase in size, and eggs do not hatch during the winter, even when they are flooded.

In studies at Strassburg, it was found that *Culex pipiens* and *Anopheles maculipennis* winter as imagoes, while *Anopheles bifurcatus* live over as larvae; *Culicada vexans* and *Culicada ornata* as eggs. The correlation between the appearance of the first generation in the spring, as well as later broods, and the factors of air and water temperature, rainfall, and water level of the Rhine are graphically presented.—W. A. R.

1008. *Description of the Male Genital Armatures of the British Anopheline Mosquitoes*. H. T. CARTER. Ann. Trop. M. & Parasitol., Liverp., 1920, 13, 453-457.

The male genitalia of *Anopheles maculipennis*, *A. bifurcatus* and *A. plumbeus* are figured and described.—W. A. R.

1009. *Malariaforschungen in Bayern. (Malarial Investigations in Bavaria.)* FRITZ ECKSTEIN. München. med. Wchnschr., 1920, 67, 183-184.

The effect of certain substances in keeping away mosquitoes was studied. It seems that the effectiveness is not dependent upon the strength nor upon what one might consider the agreeableness or disagreeableness of the odor. Lemon oil was found most efficient, though its power did not last more than 10 minutes after application to the skin.—B. C.

1010. *Mosquito Notes*. T. W. EDWARDS. Bull. Entomol. Research, Lond., 1920, 10, 129-137.

Descriptive and synonymic notes on a number of species from widely varied localities. *Ochlerotatus antipodeus*, *O. lepidonatus*, *O. echinus*, *Culex watti*, *Theobaldea arctica* and *T. indica* are new species.—W. A. R.

1011. *On the Variation of Tabanus atratus Fabricius*. C. W. JOHNSTON. Psyche, Bost., 1919, 26, 163-165.

The large black horse-fly in its distribution along the Atlantic coast from Maine to Florida is subject to considerable variation. Two well-marked varieties are designated respectively as *nantuckensis* and *fulvopilosis*.—W. A. R.

1012. *Untersuchungen über Simuliiden. (Investigations on Simuliidae.)* K. FRIEDERICH. Ztschr. f. ang. Entomol., Berl., 1919, 6, 61-83.

The most important systematic characters are afforded by the study of the hypopygium. A knowledge of the earlier stages, especially of the pupae and of their cases is also of value. Rearing is especially important since the males must be available for the study of the hypopygium.

The adults are readily reared from pupae, which do not require water but may be kept moist on the plant debris or other attachment material in glass vessels. They usually emerge in a few days. It is difficult to rear the larvae and it is also difficult to determine which larvae and pupae belong together, since the pupal cases do not contain the last larval exuvium.

Apart from the blood-sucking instinct of the adults, their most pronounced characteristic is their positive reaction to sunlight. They never enter darkened stalls to attack, but are found in these places only as they are brought in on animals.

Attempts to keep the insects in cages for experimental work were unsuccessful as the flies soon became weak, fed little and died after a few days. In studies on their rôle as disease carriers, it is highly desirable that methods for keeping them in confinement in normal condition be devised. It should be possible to keep them in a cage approximately the size of a small room with walls in part of gauze with a glass window at the top, and with plants and water supply.

The ecology of the larvae and pupae and specific characteristics are discussed in detail. The article closes with a consideration of control measures.—W. A. R.

1013. *Veroffentlichen über Viehverluste durch Stiche von Simulien.* (*The Loss of Cattle through the Bites of the Simulium.*) K. FRIEDERICH. Ztschr. f. ang. Entomol., Berl., 1919, 6, 161-167.

Unusual outbreaks of *Simulium* or black-flies, in various parts of Germany within the past few years have resulted in the death of many cattle and have attracted much attention of veterinarians. This review brings together some of the literature which has appeared in veterinary publications and is not readily available to medical men and entomologists.

According to Miessner, 1914, who autopsied animals which had succumbed "judging from the rapid course, and the brief incubation period it is a question of poisoning. The poison, which apparently resides in the saliva of the gnat, is injected into the skin and enters the circulation without any serious local irritation at the point of entry."

The parts most subject to attack were the regions of the umbilicus, udder, sides of the abdomen, throat, inner sides of the shanks, and the inside of the ear.

For protection against the attacks a mixture of vegetable tar, linseed oil, and alcohol is recommended by Brandes ('14). It should be applied to the exposed parts and should be renewed every 5 or 6 days.—W. A. R.

1014. *Pidocchi nella profilassi del tifo esantematico.* (*Lice in the Prophylaxis of Typhus Fever.*) G. ALESSANDRINI. Ann. d'ig., Roma, 1919, 29, 554-598.

Lice are classified zoologically and their anatomy studied carefully. The geographical distribution, and the normal and abnormal habitats of the two species, *P. corporis* and *P. capitis*, are discussed in detail. The following points are covered: fecundity, duration of gestation, the number of ova deposited, embryology of the ovum, larvae, adult lice, method of puncturing the human epidermis, nutrition, respiration, organs of sense, and duration of life. The effect of starvation and resistance to various agents including temperature, osmotropism, and phototropism are touched upon. Their active and passive migration, including the phenomenon of mimetism are also mentioned.

The defensive mechanism of lice is carefully considered and methods of combating it are described. In the prophylaxis of typhus fever the two most rapid methods for destroying the lice are dry heat and sulphur dioxide.—P. M.

1015. *Bibliographie der Läuse—(Anopluren) Literatur nebst Verzeichnis der Läusearten nach den Wohntieren geordnet.* (*Bibliography of the Lice—(Anoplura) Literature together with a List of Species Arranged According to Animal Host.*) H. FAHRENHOLZ. Ztschr. f. ang. Entomol., Berl., 1919, 6, 106.

This valuable paper presents in chronological order a fairly complete list of the publications dealing with the Anoplura or lice of the world. Naturally, the literature of the war period is less fully covered.

After the chronological arrangement, comes that according to author. This is followed by a list of papers which have been erroneously included in various bibliographies of the subject, but which contain nothing on Anoplura. Finally, there is given a list of species arranged according to host.—W. A. R.

1016. *The Fleas Found on Rats and their Relation to Plague.* A. W. BACOT. J. Roy. San. Inst., Lond., 1919, 40, 53-60.

A review and bibliography of the more than 30 kinds of fleas found in Great Britain and her colonies.—J. B.

1017. *Immunité de la chenille contre divers microbes.* (*Immunity of the Caterpillar to Different Bacteria.*) S. METALNIKOFF. Compt. rend. Soc. de biol., Par., 1920, 83, 119-121.

The inoculation of caterpillars with a variety of bacterial species shows that wide variations in susceptibility obtains. Upon the basis of such resistance the bacterial forms are divided into three groups, (1) those against which the caterpillar possesses a high degree of immunity, (2) those infective in large doses, and (3) those against which no immunity is present. The organisms listed in the three groups are: (1) *B. tuberculosis*, human, bovine,

avian and ichthic strains, *Bact. diphtheriae*, streptococci, *B. tetani*, Nagana trypanosomes, *B. pestis* (a relatively avirulent strain), the organisms of pseudotuberculosis and peripneumonia, and *Staphylococcus albus*. (2) Virulent *B. pestis*, *Staphylococcus aureus*, *B. perfringens*, *Vibrio septique*, *B. anthracis*, *V. cholerae*, *B. typhosus*, and the organism of fowl cholera. (3) *B. coli communis*, *V. metchnikovii*, *B. pyocyaneus*, *B. prodigiosus*, *B. subtilis*, *B. proteus*, and *B. anthracoides*.—G. H. S.

1018. *The Hypopus of Carpoglyphus anonymus* Haller. H. M. MORRIS. Ann. Trop. M. & Parasitol., Liverp., 1920, 13, 339-342.

The occurrence of the hypopial nymph appears to be confined entirely to mites belonging to the family of Tyroglyphidae. It is apparently a provision for facilitating the distribution of the species, the nymphs being adapted for transportation by insects, larger mites, and other animals. In this paper is described what is believed to be the hitherto unknown hypopus of *Carpoglyphus anonymus*.—W. A. R.

1019. *Flagellati di insetti, loro culture e potere patogeno*. (*Flagellates of Insects, their Culture and their Pathogenic Power*.) A. LAVERAN AND G. FRANCHINI. Pathologica, Genova, 1919, 11, 434.

The authors were able to grow on blood agar pure cultures of flagellates found in insects. These cultures when injected intraperitoneally infected white rats in the same manner as the human and animal leishmaniasis.—P. M.

1020. *The Eradication of Mosquitoes*. Editorial. Med. J. Australia, Sydney, 1919, 6th yr., 2, 554.

The mosquito responsible for carrying malaria plasmodia in Queensland and other parts of Australia is still uncertain. *Nyssorhynchus annulipes*, in the irrigation area of the river Murray and Queensland is found throughout Australia.

The methods adopted by Delmege in Macedonia are described in detail as they may be effective elsewhere in eliminating the breeding places of mosquitoes. Drainage is the most important measure, but decoy pools and drainage pits containing cresol are very helpful. Drip cans are unsatisfactory, mechanical stirring boards are most satisfactory. Cresol 1:100,000 is sufficient for standing water, 1:1000 in running water.—C. P. B.

## PUBLIC HEALTH REGULATION

(See also Numbers 1100, 1108, 1159)

1021. *Porteurs de germes et bacilles pseudo-diphtheriques*. (*Carriers of True and Pseudo-diphtheria Bacilli*.) C. MORET AND A. RISPAL. Rev. d'hyg., Par., 1917, 39, 76-79.

The authors advocate differentiation of true and pseudodiphtheria mainly by Gram stain, fuchsin stain obtaining distinguishing characters for pseudodiphtheria "palisade arrangement," more uniformly stained appearance of the short, heavy rods with one enlarged one (rarely slightly pointed at both ends) when the ends are more deeply stained than the middle parts. The presence of pseudodiphtheria has no relation to the development of diphtheria.—J. B.

1022. *The Control of Cerebro-Spinal Fever*. G. E. OATER. Pub. Health, Lond., 1919, 33, 26-30.

A discussion of the generally "gratifying results" obtained in the recent war, stressing chiefly the need of local isolation wards, the importance of carrier control (a rate of over 20 per cent being a "signal of danger," and the difficulty of permanently removing the organisms from the nasal membranes by drug and steam sprays.—J. B.

1023. *The Serbian Epidemics of Typhus and Relapsing Fever in 1915; Their Origin, Course, and Preventive Measures Employed for their Arrest*. (*An Aetiological and Preventive Study Based on Records of the British Military Sanitary Mission to Serbia, 1915*.) WM. HUNTER. Proc. Roy. Soc. Med., Lond., 1919, 13, 25-158.

This is a most interesting account of conditions in Serbia during the early part of the war. There is, however, little material dealing with laboratory or bacteriological subjects. As a record of public health administration it is of great value.—G. H. R.

1024. *Studies on Malaria Control. XI. Control of Malaria by Sterilization of the Human Host*. C. C. BASS. South. M. J., Birmingham, 1920, 13, 250-254.

One of a series of reports by the same author upon work carried out in Bolivar and Sunflower Counties, Mississippi. This report deals with the attempt to reduce the incidence of malaria in this district by the administration of quinine to infected persons. The incidence of the disease during the twelve months preceding treatment was 40.22 per cent, while the twelve months following treatment of infected persons showed attacks in only 4.06 per cent of the population.—J. H. B.

1025. *Results of Recent Efforts to Control Malaria.* JOHN A. FERRELL. South. M. J., Birmingham, 1920, 13, 256-259.

A brief résumé of methods recently in use, with a brief statement as to their relative value.—J. H. B.

1026. *Influenza Proclamations in New South Wales.* News Item. Med. J. Australia, Sydney, 1919, 6th year, 2, 442-443.

A proclamation was made Jan. 28, 1919, declaring the state of New South Wales an infected area due to presence of influenza. A prosecution for violation of the restrictions under this act was declared illegal by the High Court on November 14, 1919. The Court decided that as the proclamation was made under the Quarantine Act of 1897, which Act applied only to vessels and persons having communications with vessels all restrictions in connection with influenza were illegal.—C. P. B.

1027. *Damages for False Imprisonment.* News Item. Med. J. Australia, Sydney, 1919, 6th year, 2, 552.

Dr. George Fox of Balmain Sydney was arrested and committed to prison for refusing to wear a mask while in the streets of Sydney during the influenza epidemic. He sued the magistrate for £2000. The proclamation under which arrest was made had been declared illegal and he was awarded £150 damages.—C. P. B.

1028. *The Illinois Program in Child Hygiene for the Coming Year.* CLARENCE W. EAST. Am. J. Pub. Health, Concord, 1920, 10, 241-242.

Illinois intends to use her health centers for a foundation, and pursue salesmanship methods for follow-up purposes. Rural public health centers, child hygiene stations and public school nurse units are to be established and all agencies are to work in co-ordination.—M. C. P.

1029. *What Should be Done in the Control of Degenerative Diseases.* F. S. CRUM. Am. J. Pub. Health, Concord, 1920, 10, 210-215.

It is suggested that there be an extension of scientific care from infancy, through high schools and institutions of higher learning; a continued more intensive, and widespread scientific educational propaganda in the principles of good personal habits, and the extension in industrial hygiene.—M. C. P.

1030. *Venereal Disease Control.* JOE P. BOWDOIN. South. M. J., Birmingham, 1920, 13, 186-188.

A brief general statement as to the opportunities and responsibilities in control of these diseases.—J. H. B.

1031. *The Public Health Service Campaign against Venereal Disease.* C. C. PIERCE. Soc. Hyg., N. Y., 1919, 5, 415-439.

A report of the Assistant Surgeon General of the Public Health Service on the work done during the war.—J. B.

1032. *Four Million Dollars for the Fight against Venereal Diseases.* H. H. MOORE. Soc. Hyg., N. Y., 1919, 5, 15-26.

A comprehensive statement of the U. S. Public Health Service plans for this appropriation which includes an allotment (1,000,000) each year) to state boards of health. The statement includes sections on medical measures, conditions under which arsphenamine may be supplied to civilian venereal clinics and the treatment and prevention of venereal diseases.—J. B.

1033. *Marine Hygiene.* ROBERT HILL. J. Roy. San. Inst., Lond., 1919, 40, 5-26.

The report of the Surgeon Rear Admiral on sanitation in the navy during the war, covering ventilation, disinfection, water supply, and tabulating the incidence of the various diseases in the navy from August, 1914, to January, 1919.—J. B.

1034. *Some Pressing Public Health Problems.* GEORGE REID. Pub. Health, Lond., 1919, 33, 5-21.

A review of the general situation in Great Britain with emphasis on the problems of housing, tuberculosis, and the milk supply.—J. B.

## EPIDEMIOLOGY

(See also Numbers 989, 1067, 1165)

1035. *Epidemic Cerebro-Spinal Meningitis.* J. MARTIN BEATTIE. Pub. Health, Lond., 1920, 33, 105-111.

A general discussion of the methods of transfer, and of carriers and their treatment (steam sprays, chemicals, etc.). The preferred treatment is with "electrosol," a combination of hypertonic saline and chlorine solutions.—J. B.

1036. *The Bacterial Content of the Air in Army Sleeping Huts, with Special Reference to the Meningococcus.* A. J. EAGLETON. J. Hyg., Cambridge, 1919, 18, 264.

Plates were exposed at different levels above the floor. It was found that the spraying capacity of a carrier varies from 5 to 15 feet, but that the meningococcus is carried to a much shorter distance than many other organisms.—D. H. B.

1037. *Can the Tuberculosis Transmission Rate be Reduced?* JAMES G. CUMMING. J. Am. M. Ass., Chicago, 1920, 74, 1072.

The transmission rate of tuberculosis has not been markedly reduced because the attack against it has been chiefly against minor avenues of distribution. The major avenue of spread is the one that should be attacked. It was shown that rinse water from washing spoons which had been used by tuberculous patients contained virulent tubercle bacilli which proved infectious to guinea pigs. The major avenue of transmission of tuberculosis is through eating utensils. Eating utensil transmission is a three-link chain; the two end links are moist and this makes for facility of transmission. By attacking tuberculosis by the major avenue of transmission tuberculosis can be controlled as well as typhoid fever. Asepsis in treating eating utensils will accomplish more than any other single measure against the transmission of tuberculosis. Boiling water should be used for cleansing eating utensils especially in the family.—P. G. H.

1038. *Prevention of Communicable Respiratory Diseases Based on Observations in the Army Camps.* ORLANDO H. PETTY. Penn. M. J., 1920, 23, 255-258.

A review of the sanitary measures carried out in the field, barracks, kitchens and mess halls.—C. P. B.

1039. *Report on Epidemic and Infectious Diseases in Camp Devens, Mass.* PAUL G. WOOLEY. J. Lab. & Clin. M., St. Louis, 1919, 6, 28-42.

After an introductory section describing the general conditions in Camp Devens and its environment, the article discusses the problems connected with infectious diseases in the camp and the statistical facts associated with these diseases.—F. W. H.

1040. *Les porteurs du bacille diphthérique. (Diphtheria Bacillus Carriers.)* H. STEVENIN. Médecine, 1919, 1, 168.

Normal carriers are believed to have had a mild attack. The majority of these carriers become free of organisms after fifteen days. They rarely contract clinical diphtheria. Antiseptic washes and powdered antibacterial serum may give good results. Two negative examinations at eight-day intervals should be required.

The following figures, represent the number of carriers found:

	per cent
In the vicinity of diphtheria cases. . . . .	4.3
In the army at the time of an epidemic. . . . .	4.4
In the army at the time of few cases. . . . .	2.1
Outside of diphtheria foci. . . . .	0.7

—L. A. K.

1041. *Prophylaxie de la diphthérie. Traitement des porteurs de germes par les insufflations de serum sec. (The Prophylaxis of Diphtheria. Treatment of Carriers by Insufflations of Dry Serum.)* A. ARLOING. Médecine, 1919, 1, 149.

The fauces, etc., may be cleared of organisms by spraying with dried antibacterial serum mixed with some adhesive. Two negative examinations—one a week following the cessation of treatment—should be required for discharge.—L. A. K.

1042. *A Study of Pneumococcus Carriers.* J. SAILER, M. W. HALL, R. L. WILSON AND C. McCoy. Arch. Int. Med., Chicago, 1919, 24, 600-610.

Carriers were detected by the following method: swabs from the nasopharynx were spread upon human blood agar plates; greenish colonies were inoculated into the blood broth medium of Avery; after 12 hours' incubation cultures were stained by Gram's method and tested for bile solubility; those dissolved cultures were tested with type sera for the precipitin reaction. 16 per cent of 700 men were found to be carriers, distribution as to types being, Type I, 5.4 per cent, Type II, 13.52 per cent, Type III, 4.5 per cent and Type IV, 76.58 per cent. Instillation of oily solutions of phenol and iodine into the nose and pharynx is an efficient method of relieving pneumococcus carriers.—G. H. R.

1043. *Ueber die Pathogenese der Dauerausscheider und Bazillenträger. (Pathogenesis in Infection Carriers.)* JOHANNES SCHÜRRER. Berl. klin. Wchnschr., 1920, 57, 107-108.

The acute infectious diseases may be divided into 2 groups. The first is represented by those in which the infectious process, if not fatal, is fully cured in a few weeks. (Cholera, plague, measles, relapsing fever, typhus, German measles, chicken-pox and variola.) In these diseases, there occur no carriers. The second group includes those diseases whose infecting agents are able to call forth local chronic inflammations after subsidence of the acute general process. (Diphtheria, typhoid fever, dysentery, and apparently, scarlet fever.)

Only in this group are there healthy carriers to be found. The persistence of the organisms is dependent upon the presence of the chronic infection. There is no purely saprophytic multiplication in the body cavities of an immunized host.—B. C.

1044. *Cats and Human Diphtheria*. WILLIAM G. SAVAGE. J. Hyg., Cambridge, 1920, 18, 448.

The possibility that cats may serve to disseminate diphtheria was submitted to detailed laboratory investigation. Savage is of the opinion that the common and widely accepted view that cats suffer from a naturally acquired disease caused by *Corynebacterium diphtheriae* is entirely without foundation and that the mucous membranes of these animals are particularly inimical to these bacteria. On the other hand, a large proportion of healthy normal cats contain in their throats bacilli which closely resemble and are difficult to distinguish from the true *C. diphtheriae*.—D. H. B.

1045. *Rat-Bite Fever, Report of a Case*. A. ARKIN. Arch. Int. Med., Chicago, 1919, 24, 94-111.

Rats infected with *Spirocheta morsus muri* may be widely distributed.—G. H. R.

1046. *The Rat as a Carrier of Diseases Transmissible to Man and the Lower Animals*. ALEX. G. R. FOULERTON. J. Roy. San. Inst., Lond., 1919, 40, 61-69.

The rôle of rats in tuberculosis, plague, trichiniasis, spirochetal jaundice, rat-bite fever, and other protozoan diseases.—J. B.

1047. *Infectious Diseases and Their Propagation*. JAMES A. HISLOP. Pub. Health, Lond., 1920, 33, 53-60.

A paper read before a meeting of medical officers, reviewing the rôle of carriers: the louse, bedbug, flea, mosquito, and fly as well as human carriers.—J. B.

1048. *Botulism*. WALTER L. DODD. Am. Food, J. Chicago, 1920, 15, 2-14.

A popular article on investigations showing the probable cycle in *B. botulinus* transfers—animal excreta, soil, birds or insects and finally fruits or vegetables. Emphasis is laid on care in food preparation; soundness of materials canned, cleanliness, adequate sterilization and the discarding of all canned goods of questionable odor or taste.—J. B.

1049. *Beobachtungen bei Parotitis epidemica. (Epidemic Parotitis.)* FRANE BARDACHEI AND ZOLTAN BARABAS. München. med. Wchnschr., 1920, 67, 185.

A report of 92 cases occurring in the garrison of Przemyśl. Forty-six per cent of the cases occurred in persons 18 to 20 years of age, and only 4 per cent in those over 40. The incubation period was 18 days.—B. C.

## INDUSTRIAL HYGIENE

1050. *The Control of Infectious Diseases in Industrial Communities*. HANS ZINSSER. J. Indust. Hyg., N. Y., 1920, 1, 501 and 525.

The infectious diseases discussed are divided into those of (1) the respiratory tract, (2) those of the digestive tract, and (3) those transmitted by insects. The epidemiologic principles involved in the dissemination and control of these diseases are discussed and experience gained during the war is correlated with conditions prevailing in industrial communities.—D. H. B.

1051. *The Mortality of Bituminous Coal Miners from Influenza-Pneumonia. Oct.-Dec., 1918*. LOUIS I. DUBLIN. J. Indust. Hyg., N. Y., 1920, 1, 483.

Among 4700 miners there were 64 deaths, equivalent to an annual death rate of 50 per 1000. The highest death rate occurred among those between the ages of 25 to 45.—D. H. B.

1052. *A Further Plea for an International Standard of Hygiene for Crews' Spaces in Merchant Ships*. J. HOWARD JONES. J. Roy. San. Inst., Lond., 1920, 40, 214-222.

Basic standards needed with regard to ventilation, drainage, water supply, and sleeping and working quarters.—J. B.

1053. *Industrial Diseases under the Mediaeval Trade Guilds*. THOMAS M. LEGGE. J. Indust. Hyg., N. Y., 1920, 1, 475.

Extracts with comments on "Diseases of Artificers and Tradesmen" by Bernardo Ramazzini, 1700.—D. H. B.

## RURAL SANITATION

1054. *Malaria Control in Rural Communities by Anti-Mosquito Measures*. H. H. HOWARD. South. M. J., Birmingham, 1920, 13, 260-265.

A general descriptive article laying particular stress upon drainage of a permanent character.—J. H. B.

## DISINFECTION AND GROWTH INHIBITION

1055. *Germicidal Activity of Eucalyptus Oils*. R. T. BAKER AND H. G. SMITH. Med. J. Australia, Sydney, 1919, 6th year, 2, 401-402.

A summary of work by R. T. Baker, H. G. Smith and R. Greigh Smith, published in Proc. Linnean Soc., N. S. W., 1919, 44, 311. The first two named selected the plants and distilled the oils, while the latter made a study of the germicidal value of some of them. *B. coli communis* was the test organism and phenol was used for comparison.

They demonstrated that oil from each species of eucalyptus is distinct and characteristic for the species. The principal ingredient varies; in one it is cineol, in another phellandrene or pinene and in others an ester such as geranial acetate.

The coefficient curve of cineol reaches a maximum of 3.4 in 30 minutes and falls slowly to 2.8 in 4 hours. A crude oil has less action than cineol but rectified oil is a more powerfully germicidal. The older and more acid the oil, the higher appears to be the phenol coefficient.

Certain oils are more active than those containing cineol, other oils with certain ingredients and cineol are more active than pure cineol.

Pinene and sesquiterpene have low coefficients. Peperitone and phellandrene are more active than cineol. Aromandendral has twenty times the activity of phenol in exposures of one hour. When diluted with neutral oils these eucalyptus oils have little germicidal activity.—C. P. B.

1056. *Advertising of Disinfectants*. EDITORIAL. Am. J. Pub. Health, Concord, 1920, 10, 357.

The American Public Health Association is sending a circular letter to advertising agents and to manufacturers of disinfectants warning them against making unwarranted claims concerning disinfectants.—M. C. P.

## WATER AND SEWAGE BACTERIOLOGY

1057. *Notes on Experiences with the Presumptive and Confirmatory Tests for B. coli in Water Analysis for the American Expeditionary Forces*. MAX LEVINE. J. Am. Water Works Ass., 1920, 7, 188-192.

Decimal dilutions of the water were inoculated into lactose broth and if gas formed in 1 or 2 days, it was taken that the water contained *B. coli*. Levine states that the *positive presumptive test* (10 per cent of gas in 24 hours) is very reliable index of the presence of *B. coli* when dealing with untreated waters but not so with waters which have been chlorinated. The *doubtful presumptive test* (less than 10 per cent of gas in 24 hours or more than this quantity on 48 hours) is only fair index of the probable presence of *B. coli* in untreated waters. This is not true for waters which have been chlorinated. A small amount of gas in 24 hours is a better index of the presence of *B. coli* than 10 per cent of gas in 48 hours. The rate of gas production seems to be more significant than the amount formed. Levine used the simplified eosin-methylene blue agar. Levine states that this information should be of interest to those who are analyzing both untreated and treated waters.—F. W. T.

1058. *Importance of Confirmatory B. coli Tests in Fairly Safe Drinking Water*. N. NOVICK. Am. J. Pub. Health, Concord, 1920, 10, 305-307.

Fifty-seven waters from a fairly safe source from a sanitary point of view have been tested and 22.8 per cent positive tests for *B. coli* found during a period of 5 months.—M. C. P.

1059. *Bacteriological Examination of Soft Drinks*. WILLIAM R. STOKES. Am. J. Pub. Health, Concord, 1920, 10, 308-311.

Many soft drinks contain variable numbers of bacteria which may be explained in part by improper sterilization of bottles. A few bacteria remaining in the bottles may increase in the small quantities of water often remaining in the bottles after sterilization. Dust organisms may resist sterilization even if the bottles are carefully dried.—M. C. P.

1060. *The Practical Design and Management of Swimming Pools*. Am. City, N. Y., 1920, 22, 224-225.

A discussion of methods of construction and purification, including the care of outdoor pools.—J. B.

1061. *Treatment of Beet Sugar Plant Sewage*. LANGDON PEARSE AND SAMUEL A. GREELY. Am. J. Pub. Health, Concord, 1920, 10, 313-323.

Fine screenings and sedimentation are indicated as necessary for any type of treatment plant. The effluent of the settling tanks can be treated on sprinkling filters; crude concentrated sewage could be dosed at about 200,000 gallons per acre per 24 hours, and sand filters 75,000 gallons per acre per 24 hours. If concentrated sewage be mixed with an equal volume of beet-carrying water the settled effluent could be treated on sand filters dosed at the rate of 100,000 gallons per acre per 24 hours.—M. C. P.



## FOOD BACTERIOLOGY

1062. *Botulism, a Study of the Resistance of the Spores of Bacillus botulinus to Various Sterilizing Agencies which Are Commonly Employed in the Canning of Fruits and Vegetables.*

E. C. DICKSON, G. S. BURKE AND E. S. WARD. Arch. Int. Med., Chicago, 1919, 24, 581-599.

A series of experiments was performed by the authors simulating the different methods of home canning of foods. Spores of *B. botulinus* are much more resistant to heat than has generally been supposed, especially when mixed with animal or vegetable protein. The method of acidification of vegetables with lemon juice does not prevent the formation of toxin although it does lower the thermal death point of the spores. Addition of 64 per cent of sugar inhibits, but does not prevent, toxin production. Growth and toxin production of *B. botulinus* occurs in canned fruits as well as vegetables.—G. H. R.

1063. *Control des conditions de fabrication et de mise en vente des conserves de viande.* (Control of Conditions of Manufacture and Sale of Preserved Meat.) M. G. BARRIER. Rev. d'hyg., Par., 1917, 39, 47-54.

Report of a commission on the preparation and handling of meats, recommending more rigid meat inspection and the labelling of meat products to indicate the per cent of all contained substances, spices and flavoring excepted.—J. B.

1064. *Sobre los procedimientos biologicos de diferenciacion especifica de carnes y leches.* (The Biological Processes in the Specific Differentiation of Flesh and Milk.) JUAN DE CASTRO Y VALERO AND TOMAS CAMPUZANO E IBAÑEZ. Rev. zootec., Buenos Aires, 1919, 6, 823-837.

The precipitation test is a satisfactory biological process for the specific differentiation of animal protein, especially of the muscle tissue; the anaphylaxis reactions, a biological reaction more feasible than precipitation for the specific differentiation of the animal protein as it is demonstrable even with small amounts especially applicable to milk. Complement fixation is satisfactory for the specific differentiation of animal proteins, principally of fresh meat and that dried for storage but it is not applicable to the albumin preserved by heat or antiseptics or in the incipient state of alteration. For certainty in the specific differentiation of the animal proteins in flesh and meat, the use of all three of these well-known reactions is recommended.—H. M.

1065. *The Contamination of Oysters.* A. T. NANKIVELL AND J. M. STANLEY. J. Hyg., Cambridge, 1920, 18, 465.

The object of the investigation was to determine the source of the pollution of oysters in Poole Harbor, the nature of the infecting microorganisms, and the discovery of methods to remedy the conditions.

Samples of both sea water and of minced oysters were plated in neutral-red bile-salts, peptone-lactose agar. MacConkey lactose tubes were also inoculated. The technic was that usually employed in the examination of samples of drinking water, as far as the sea water was concerned. The outside of the oyster was cleansed by scrubbing under running water and opened with a sterile knife, and the content finely minced before removal from the shell. Each oyster was emulsified in 100 cc. of sterile saline; 0.5, 1 and 5 cc. of the emulsified oyster was then plated.

Lactose fermenting organisms were found in amounts as high as 3000 per oyster. Streptococci, *Bact. coli* and *B. welchii* were also found.

It was found that the oysters became polluted through sewage brought into the harbor from the sea, where several towns, nearby, discharged their sewage. The trouble could be remedied by relaying the oysters in a part of the harbor to which the sewage was not carried by the tide.—D. H. B.

1066. *The Purification of Oysters.* WILLIAM F. WELLS. Am. J. Pub. Health, Concord, 1920, 10, 342-344.

It is impractical to rule that oysters should be grown in water that would be endorsed without treatment for drinking water; it is possible for oysters to purify themselves if placed in pure water.—M. C. P.

1067. *New Methods of Food Dehydration.* K. GEO. FALK. Am. Food J., Chicago, 1920, 15, 15-17.

A brief popular review and comparison of the air dry, the moist air and the vacuum processes with a discussion of the special considerations in dehydrating meats.—J. B.

1068. *The Ripe Olive Process as Used in California Factories.* Am. Food J., Chicago, 1919, 15, 28.

An abstracted report of the Los Angeles Olive Growers Association Method of picking, treatment with lye, brining, packing and sterilizing by heat, with remarks on the weak points: temperature conditions in the brine stage and perhaps in the final sterilizing process itself.—J. B.

1069. *Methods for Detecting Decomposition in Catsup.* ANON. *Am. Food J.*, Chicago, 1920, 15, 20.

A popular review of the Federal methods of determining spoilage in catsup and tomato goods by microscopic methods, emphasizing the mold counts.—J. B.

1070. *What Should Be the Basis of the Control of Dehydrated Foods.* SAMUEL C. PRESCOTT. *Am. J. Pub. Health*, Concord, 1920, 10, 324-326.

From the practical standpoint, the use of dehydrated vegetables is to be commended if they are prepared from the best quality of raw material and by methods which conserve their food values to the highest possible degree.—M. C. P.

1071. *Étude bactériologique des poudres d'oeufs. (The Bacteriology of Dried Eggs.)* A. SARTORY AND L. FLAMENT. *Bull. Acad. de méd., Par.*, 1920, 83, 46-47.

The bacteria found in the powdered egg material were classified in the following groups.

1. Micrococci.

*Staphylococcus citreus.*

Another form which liquefies gelatin and ferments milk.

Two varieties not liquefying gelatin which resemble the enterococcus.

2. Bacilli

*B. subtilis* (present in every sample).

An organism of the colon group which does not produce indol and partially liquefies gelatin in 3 weeks.

An organism which is proteolytic, ferments saccharose and produces a yellow pigment.

—G. H. R.

#### HEALTH BOARD LABORATORY METHODS

(See also Numbers 1011, 1153)

1072. *Untersuchungen tuberkulöser Sputa mittels des Zinkfällungsverfahrens. (Examination of Tuberculous Sputums by Means of the Zinc Precipitation Method.)* A. v. FIEBER AND W. v. SCHULZ. *Wien. klin. Wchnschr.*, 1920, 33, 43-44.

Sputum is homogenized with 10 per cent antiformin and to it is added a small amount of 20 per cent zinc acetate or chloride. The quantity of precipitant is so chosen that the resulting precipitate may be conveniently worked on a slide. After settling for several hours, the greater amount of the fluid is poured off, and the residue transferred to a pad of filter paper to remove most of the adhering water. The precipitate is next transferred in a rather thick layer to a slide, dried, fixed in the flame and stained. This method permits the ready examination of large individual specimens of homogenized sputum. The percentage of positive findings is considered especially good.—B. C.

#### CANCER RESEARCH

1073. *Cancer Research.* SIR WILLIAM CHURCH. *Nature*, 1919, 103, 435.

A summary of the work of the Imperial Cancer Research Fund during the war, both on cancer and on other subjects. "The effect of withdrawing a large number of males for military service was to alter the age-constitution of the civil population, producing an apparent increase in the total male death-rate from cancer. The female rate was unaffected, and the apparent rise for males disappeared when the necessary correction was made. The method of autologous transplantation had been used to separate tumor-like proliferations of lymphoid tissue from the true malignant new growth of mice. The former never grew on grafting into the affected animal itself, even when recurrence and dissemination occurred. Autologous grafts of true new growth were practically always successful, whether recurrence took place or not. Experiments were carried out on the relation of the water-content of tumors to their rate of growth. In harmony with the findings for normal tissues in animals and plants, the tumors showed a close relationship in this respect, the more rapidly growing tumors having the higher percentage of water. The water-content of tumors could be artificially reduced by exposure to isotonic calcium chloride solution *in vitro*, and such material on inoculation exhibited diminished powers of growth, from which recovery was slow but complete.

"The work on war problems . . . dealt, first, with the heat-regulating mechanism of the body, especially the rôle played by the thyroid-adrenal apparatus, and its derangements in disease accompanied by fever or hypothermia. A second paper was devoted to the pathology of gas gangrene. It could be shown that a specific local injury of the tissues permitted the development of the anaerobic bacteria of gas gangrene and tetanus. Substances present in cultivated soil, particularly ionizable calcium salts, were able to produce the necessary lesion which breaks down the otherwise efficient natural defences against these micro-organisms. These two papers and another on the fate of grafted cartilage, will shortly be published in the Sixth Scientific Report of the fund."—Z. N. W.

1074. *Beiträge zur Röntgentherapie des Krebses. (X-ray Therapy in Cancer.)* W. LOBENHOFER. *München. med. Wchnschr.*, 1920, 67, 119-120.

Röntgen rays as a cure for cancer have not yet demonstrated their efficacy. In addition, the treatment is not without danger.—B. C.

## DISEASES OF THE BLOOD, LYMPHATICS AND DUCTLESS GLANDS

(See also Number 1198)

1075. *Zur Kasuistik des Rückfallfiebers. (Case of Relapsing Fever.)* KURT KAYSER. Berl. klin. Wchnschr., 1920, 57, 129-130.  
An atypical case of relapsing fever in which the causative organism was recovered from the blood of the patient.—B. C.

## DISEASES OF THE DIGESTIVE SYSTEM

(See also Numbers 887, 888, 981, 982, 983, 987, 1155, 1200, 1201)

1076. *Is Sprue Endemic in the South?* MARK F. BOYD. South. M. J., Birmingham, 1920, 13, 229-232.  
The author reports two cases diagnosed as sprue in patients who had never been outside the United States. He believes that the *Monilia pilosis* has been conclusively proven to be the etiologic organism in sprue and that sprue is endemic in the southern states.—J. H. B.

1077. *Typhoid Fever in the American Expeditionary Forces: A Clinical Study of Three Hundred and Seventy-Three Cases.* VICTOR C. VAUGHAN. J. Am. M. Ass., Chicago, 1920, 74, 1145.  
After studying 270 cases in which the patients, who had received triple typhoid vaccine, and were infected with *B. typhosus*, the conclusion was reached that the clinical picture of typhoid in the vaccinated was similar to that in the unvaccinated. Positive blood cultures were about the same in both classes of patients. The severity of patients infected within 8 months after vaccination was less than 10 per cent. After 8 months the severity percentage increases. It is probable that a large number of vaccinated persons were infected with *B. typhosus* who never were sick enough to require admission to the hospital. The incidence of the typhoid group of diseases in the American expeditionary forces was less than 0.1 per cent while it was 20 per cent in the Spanish-American War.—P. G. H.

1078. *Typhoid and Paratyphoid Fever at Mesves Hospital Center.* FRANK MOCK. J. Lab. & Clin. M., St. Louis, 1919, 5, 54-55.  
A summary of the work on enteric diseases done at the Center Laboratory of Mesves Hospital Center.—F. W. H.

1079. *Péritonite par propagation dans les maladies typhoïdes. (Non-perforating Peritonitis in Enteric Fevers.)* F. RATHERY. Médecine, 1919, 1, 144.  
In typhoid and paratyphoid fevers, peritonitis without perforation, usually not fatal, was commonly observed by the author.—L. A. K.

1080. *Some Experience with Dysentery in the Palestine Campaign.* C. BICKERTON BLACKBURN. Med. J. Australia, Sydney, 1919, 6th year, 2, 148-150.  
The bacteriological findings showed *Amoeba histolytica*; *B. dysenteriae*, Shiga and Flexner, the Flexner being the more common. Treatment varied according to infection, emetin or antidyenteric serum being used.—C. P. B.

## DISEASES OF THE GENITO-URINARY SYSTEM

(See also Numbers 1020, 1022, 1170, 1185, 1189)

1081. *The Incidence of Syphilis among White and Colored Troops as Indicated by an Analytical Study of the Wassermann Results in over Ten Thousand Tests.* WILLIAM LEVIN. J. Lab. & Clin. M., 1919, 5, 93-106.  
This work indicates the existence of a definite percentage of syphilis among the white and colored troops. Based on double plus reactions this is 10.5 per cent for the former and 18.3 per cent for the latter. Considering the single plus reactions in this series as diagnostic, these percentages are 13.8 for the white and 24.1 for the colored troops. The author estimates that as high or probably higher percentages of syphilitics exist among the white and colored civilians of the ages 21 to 31.—F. W. H.

1082. *Das venerische Granulom. (Venereal Granuloma.)* W. H. HOFFMANN. München. med. Wchnschr., 1920, 67, 159-163.

This is an infectious disease prevalent in the tropics and called the fourth sex disease because, so far as is known, it is transferred only during sexual intercourse. The infectious agent is a capsulated organism: *Calymmatobacterium granulomatis*.—B. C.

1083. *Ein neues unspezifisches Provokationsverfahren bei der männlichen Harnröhren gonorrhoe.* (A New Non-specific Provocative Procedure in Male Urethral Gonorrhoea.) ERNST FRIEDRICH MÜLLER. München. med. Wchnschr., 1920, 67, 9-12.

A provocative reaction in gonorrhea may be obtained with non-specific bacterial antigens, but there is danger of serious complications. An intracutaneous injection of bacteria- and toxin-free milk-protein is found to be a very effective agent in arousing a reaction in latent urethral gonorrhea. There occurs only a moderate leucocytosis but after 6 hours the patient experiences a slight itching in the urethra, following which there is distinct increase in the discharge. Examination of this discharge will disclose the presence of the gonococcus if the infection is due to this agent. This procedure has yielded superior results over the customary methods now in use.—B. C.

1084. *Praxis der Gonokokkenuntersuchung.* (Detection of the Gonococcus.) F. W. OELZE. München. med. Wchnschr., 1920, 67, 15-16.

An outline of the procedures useful in demonstrating the presence of the gonococcus in urethral discharges. Methods of staining are described in detail.—B. C.

## DISEASES OF THE LOCOMOTOR SYSTEM

(See also Number 1137)

1085. *Zur Eosinophilie bei Muskelrheumatismus.* (Eosinophilia in Muscular Rheumatism.) INA SYNWOLDT. München. med. Wchnschr., 1920, 67, 98-99.

In acute muscular rheumatism an eosinophilia is the characteristic blood picture, while in the chronic form of the disease there is a higher grade of lymphocytosis. The eosinophilia may be regarded as due to the effect of muscle-protein split products upon the hematopoietic organs.—B. C.

1086. *Ueber Rheumatismus.* (Rheumatism.) E. ROOS. München. med. Wchnschr., 1920, 67, 103-106.

A general review including only contributions from the German and Austrian schools.—B. C.

## DISEASES OF THE NERVOUS SYSTEM

(See also Numbers 1012, 1026, 1145, 1150, 1152, 1178, 1179, 1195, 1196)

1087. *Localized Tetanus.* CHARLES GREENE CUMSTON. New York M. J., 1919, 109, 417.

Localized tetanus is always a chronic tetanus and is particularly marked by its long duration. The incubation period is usually from one to three months. There are three forms of contracture: (1) purely localized; (2) primary generalized form with secondary localization; (3) localized at first and then becomes general. Even in cases progressing normally toward recovery certain complications may be feared, that is, the contracture often subsisting for many weeks in the same groups of muscles, results in serious lesions which are sometimes permanent. The treatment is the same as for any case of tetanus.—G. M. S.

1088. *Rabies.* STEWART STOCKMAN. J. Roy. San. Inst., Lond., 1920, 40, 268-270.

An abstract of a report on the after-war introduction of rabies into the United Kingdom—the first cases since the elimination of rabies in 1902. Over 100 cases have been reported during the latter part of 1919. Attention is called to the wide range of territory covered by several of these rabid dogs, several of them having indisputable records of 12, 20, and even 30 miles.—J. B.

1089. *Epidemic Cerebrospinal Meningitis.* JOSEPH SAILER. Penn. M. J., 1920, 23, 250-255.

The meningococcus enters the body by the upper respiratory tract and lodges in the nasopharynx. Carriers are of three types: (1) premeningeal stage; (2) casuals; (3) chronic carriers; formerly it was considered a serious matter to make 50 or 100 cultures a day. At Camp Funston in 1918, 38,000 cultures were made in one month. Carriers varied in numbers from 1 to 16 per cent. Vaccines had been used, first dose 500,000,000, second and third doses 1,000,000,000. There is no evidence that it clears a carrier, but it may prevent him from becoming infected. The author draws attention to Herrick's use of antimeningococcal serum intravenously.—C. P. B.

1090. *Meningitis typhosa oder Meningotyphus?* (Typhoid Meningitis or Meningo-typhoid Fever?)

KARL MEYERHOF. Berl. klin. Wchnschr., 1920, 57, 132-134.

Meningitis due to the typhoid bacillus may occur as a primary localization of the organism or as a metastatic complication in the general infection. If it proceeds as a part of the general infection it is known as typhoid meningitis. If the process remains localized in the brain and meninges, it is spoken of as meningo-typhoid fever.—B. C.

1091. *An Experimental Investigation of an Australian Epidemic or Acute Encephalo-Myelitis.* J. B. CLELAND AND A. W. CAMPBELL. J. Hyg., Cambridge, 1919, 18, 272.

The disease was at first thought to be "acute poliomyelitis;" it was extremely fatal and attacked a number of adults. However, the histological picture differed from "acute poliomyelitis," in that the lesions were distributed throughout the central nervous system as well as the spinal cord.

It was possible to communicate the disease to monkeys, sheep, horses and calves. The virus could be injected in fresh blood, in blood obtained after death, and suspended in normal salt solution or in 33 per cent glycerine.—D. H. B.

1092. *Tuberculous Meningitis and Encephalitis Lethargica.* J. H. HARVEY PIRIE. Med. J. S. Africa, Johannesburg., 1919, 15, 109-110.

Attention is drawn to the confusion between these two diseases. Two cases are reported which simulated the latter disease but examination revealed many tubercle bacilli in the inflammatory tissue; no other tuberculous lesions were found.—C. P. B.

1093. *L'encéphalite épidémique. (Epidemic Encephalitis.)* M. CHAUFFARD. Bull. Acad. de méd., Par., 1920, 83, 140.

From a clinical point of view epidemic encephalitis may be divided into lethargic, delirious, mental, myoclonic and ambulatory types.—G. H. R.

1094. *Apparition de l'encéphalite léthargique épidémique à Lille. (Appearance of Epidemic Lethargic Encephalitis at Lille.)* COMBEMALE AND E. DUHOT. Bull. Acad. de méd., Par., 1920, 83, 71-73.

The clinical symptoms of several cases are reported. Blood cultures and serum tests were negative.—G. H. R.

1095. *L'encéphalite léthargique à Tanger. (Lethargic Encephalitis at Tangier.)* M. P. REMLINGER. Bull. Acad. de méd., Par., 1920, 83, 112-116.

Microscopic examinations, cultures and inoculations were entirely negative.—G. H. R.

1096. *Ueber Encephalitis lethargica. (Lethargic Encephalitis.)* FR. GROEBBELS. München. med. Wchnschr., 1920, 67, 131-133.

The clinical symptoms in the order of frequency are: somnolence, ptosis, headache and fever, rigor of the extremities, double vision, nystagmus and pyramidal disturbances. The disease attacks alike both males and females of all ages. Its etiology is not clear.—B. C.

1097. *An Obscure Disease, Encephalitis Lethargica.* C. H. B. Nature, 1920, 104, 452-453.

This disease appeared in England about two years ago. A brief description is given of histopathological findings. Failure has resulted in attempts to reproduce the disease experimentally and to find any microorganism constantly associated with it. One of the unaccountable manifestations of the disease was its almost simultaneous occurrence in England, France, and Austria.—Z. N. W.

#### DISEASES OF THE RESPIRATORY SYSTEM (EXCEPT INFLUENZA AND TUBERCULOSIS)

(See also Numbers 1151, 1161)

1098. *An Unrecognized Pathway for Bacterial Invasion of the Respiratory Tract.)* M. C. WINTERITZ, G. H. SMITH AND E. S. ROBINSON. Johns Hopkins Hosp. Bull., Balt., 1920, 31, 63-66.

The authors attempt to answer the question how, in the absence of gross lesions of the upper respiratory tract, inflammation of the lung can occur. The results of insufflation of the trachea and of intratracheal inoculation through the skin and the study of the lymphatics of the submucosa of the trachea and bronchi indicate that the plexus of lymphatics within the submucosa of the trachea serves as the pathway of infection in such cases.—F. W. H.

1099. *Pneumonia in Influenza.* ALFRED C. REED. New York M. J., 1919, 109, 406.

The author reports two cases of pneumonia associated with influenza. Case I, a streptococcus pneumonia supervened on an influenza in a patient who had an old streptococcus rheumatism and cardiac infection. Case II, a bronchopneumonia clinically typical of influenza followed by a pneumonia clinically characteristic of pneumococcus infection.—G. M. S.

#### INFLUENZA

1100. *III. The Fate of Influenza Bacilli Introduced into the Upper Air Passages.* ARTHUR L. BLOOMFIELD. Johns Hopkins Hosp. Bull., Balt., 1920, 31, 85-89.

When these organisms are introduced in large numbers into the normal upper respiratory tract they disappear rapidly and the author's experiments indicate that this is probably due to the combination of an unfavorable environment with the mechanical flushing processes at work in these regions.—F. W. H.

1101. *Epidemic Influenza at the Cook County Hospital.* JAMES C. SMALL AND FRED H. STANGL. J. Am. M. Ass., Chicago, 1920, 74, 1004.

The study comprised 829 cases. Forty-six or 9.1 per cent of cases admitted with influenza developed pneumonia and 47.8 per cent of these died. *B. influenzae* was isolated from 100 per cent of the patients studied and from 95.5 per cent by the direct sputum and throat culture method. Pneumococci were found in 84.4 per cent of the cases of pneumonia studied and for the most part represented the types of pneumococci found in the mouths of normal persons. Hemolytic streptococci were found in 18.7 per cent and *B. influenzae* in 75 per cent of the cases of pneumonia.—P. G. H.

1102. *Pathology of Influenza-Pneumonia.* ORVILLE J. WALKER. J. Lab. & Clin. M., St. Louis, 1919, 5, 154-175.

The writer gives a report of the pneumonia occurring at Camp Sherman during the pandemic and attempts a classification of the conditions met with. He groups them under (1) acute pulmonary edema; (2) bronchopneumonia, (a) interstitial type, (b) lobular type; (3) lobar pneumonia type.

He finds influenza pneumonia to be primarily an acute, hemorrhagic lesion, interstitial, nodular, or massive in extent, rising from a pulmonary capillary phlebitis with disseminated capillary necrosis due to some toxic agent and resulting in a secondary purulent pneumonia with healing by organization. The writer found no correlation between the type of organisms present and the character of the lung lesion. As complications, empyema and pericarditis are of frequent occurrence.—F. W. H.

1103. *Grippe et peste pulmonaire. (Influenza and Pneumonic Plague.)* C. BROQUET. Bull. Acad. de méd., Par., 1920, 83, 116-119.

There is no similarity between the two diseases. The author recommends the isolation of cases of influenza and vaccination with such organisms as the bacillus of Pfeiffer, pneumococcus and streptococcus.—G. H. R.

1104. *Zur Klinik der epidemischen Grippe im Säuglingsalter. (Symptomatology of Epidemic Grip in Infants.)* A. REICHE. Deutsche med. Wchnschr., Berl. & Leips., 1920, 46, 75-76.

Epidemic grip during the fall of 1919 ran a generally milder course in infants than in adults. On the other hand, endemic cases were observed to run as severe a course in infants as in adults.—B. C.

1105. *Pathologic Anatomy and Bacteriology of Influenza. Epidemic of Autumn, 1918.* B. LUCKE, T. WIGHT AND E. KIME. Arch. Int. Med., Chicago, 1919, 24, 154-237.

In the early stages of the epidemic *B. influenzae* was the predominating organism. Later non-hemolytic streptococci and pneumococci appeared and finally the hemolytic streptococcus was most commonly found. The authors make the valuable suggestion that the total bacterial flora should be recorded.—G. H. R.

1106. *Introduction to a Discussion on Pneumonic Influenza.* ALEX LEWERS. Med. J. Australia, Sydney, 1919, 6th year, 2, 167-170.

The term influenza now covers three groups of disorders: (1) common cold due to organisms other than *B. influenzae*; (2) catarrhal fever with a variety of symptoms, generally attributed to *B. influenzae*; (3) pandemics occurring at long intervals.

A description of the clinical course of the disease and treatment is given. Attention is drawn to certain researches in which a filter-passing organism has been isolated.—C. P. B.

1107. *Some Notes on Pneumonic Influenza.* LUCY GULLETT. Med. J. Australia, Sydney, 1919, 6th year, 2, 170-173.

The clinical description of the disease is given in considerable detail. A mixed vaccine, also antipneumococcal and antistreptococcal serum were used as part of the treatment with apparently good results. The author thinks lice may have been one of the means of spreading the disease among the soldiers of France and England.—C. P. B.

1108. *The Bacteriology of Influenza-Pneumonia.* A. H. TEBBUTT. Med. J. Australia, Sydney, 1919, 6th year, 2, 499-506.

No work was done on filter passing or anaerobic organisms and little attention was paid to *B. influenzae*. Attention was concentrated on the pneumococcus-streptococcus group.

Twenty-nine autopsies showed:

#### From heart blood

Pneumococci isolated	4 cases
Pneumococci and <i>B. influenzae</i>	1 case
The others were probably contaminations.	

#### From lungs

Staphylococci	10 cases
Pneumococci	6 cases
Influenza Bacilli	8 cases

Pneumococci and Staphylococci.....	2 cases
Streptococci and Staphylococci.....	1 case
Pneumo-Streptococcus group.....	1 case
Staphylococci and Gram-negative bacilli.....	1 case

*Twenty-five blood cultures taken during life*

Sterile.....	15 cases pneumonia
Streptococcus.....	1 case
Staphylococcus.....	2 cases
Pneumococcus (Type III).....	1 case
The staphylococci may be considered as contaminations.	
Sterile.....	4 cases not pneumonic
Diphtheroid.....	1 case not pneumonic
Staphylococci.....	1 case not pneumonic

Probably the diphtheroid and staphylococci may be considered contaminations. Of 3 cases in which pleural exudates were examined, 2 showed pneumococcus Type III. The morphology of the strains isolated was studied together with typing by agglutination test.—C. P. B.

1109. *Necropsy Studies at a Hospital Center.* M. BARRON. Arch. Int. Med., Chicago, 1919, 24, 302-320.

In only 3 cases out of 356 was the influenza bacillus found and in these cases the pneumococcus was also present. The author suggests that a filterable virus is most probably the etiologic factor in influenza. Twenty-two cases of meningitis came to necropsy and 11 of these were due to the meningococcus, 3 were due to the pneumococcus, 1 was due to the tubercle bacillus and 7 were infections following traumatic lesions.—G. H. R.

### TUBERCULOSIS

(See also Numbers 1087, 1088, 1154, 1173, 1174, 1175, 1176, 1177, 1183, 1198, 1199)

1110. *Les acquisitions récentes de la médecine expérimentale dont il faut tenir compte désormais dans nos efforts de lutte antituberculeuse.* (Recent Additions to Experimental Medicine of Value in the Antituberculosis Campaign.) M. A. CALMETTE. Bull. Acad. de méd., Par., 1919, 82, 275-281.

This paper is a review of the modes of infection in tuberculosis.—G. H. R.

1111. *Coccidioidal Granuloma, Including the First Reported Case East of the Mississippi.* KENNETH M. LYNCH. South. M. J., Birmingham, 1920, 13, 248-249.

The report of a case diagnosed as pulmonary tuberculosis which came to autopsy at which the true nature of the disease was discovered. Description of the distribution of the parasites and the histologic changes. The author claims this to be the first case of coccidioides immitis infection east of the Mississippi, the forty-fifth known, the second case in a woman, and the fourth that was not in California.—J. H. B.

1112. *Étude d'un Aspergillus du groupe fumigatus, Aspergillus fumigatus var minimus.* (A Study of *Aspergillus fumigatus* var. *minimus*.) A. SARTORY. Bull. Acad. de méd., Par., 1919, 82, 304-305.

This organism was isolated from the sputum of a suspected case of pulmonary tuberculosis. It showed the following biological characteristics: gelatin is liquefied in 8 days; milk is coagulated and digested in 10 days; saccharose is reduced in 5 days; maltose is not split; lactose undergoes no change; glucose is not split into alcohol; the organism is pathogenic for guinea pigs and rabbits.—G. H. R.

1113. *Studies on the Viability of the Tubercle Bacillus.* J. B. ROGERS. Am. J. Pub. Health, Concord, 1920, 10, 345-347.

Living tubercle bacilli in dust can withstand drying and the effect of diffused light and still retain virulence. The importance of housing advanced cases of tuberculosis where dissemination is reduced to a minimum is emphasized.—M. C. P.

1114. *Les formes ouvertes de la tuberculose chez les carnivores domestiques.* (Open Forms of Tuberculosis in Cats and Dogs.) G. PETIT. Bull. Acad. de méd., Par., 1919, 82, 310-313.

The author concludes that human tuberculosis is easily transmitted to dogs and cats and that infected dogs and cats may transmit the disease to human beings.—G. H. R.

1115. *Contribution à la prophylaxie de la tuberculose bovine.* (Contribution to the Prophylaxis of Bovine Tuberculosis.) J. LIGNIÈRES. Bull. Acad. de méd., Par., 1919, 82, 505-507.

This paper deals with administrative methods of controlling infected cattle.—G. H. R.

1116. *Contribution à la prophylaxie générale de la tuberculose humaine. (Contribution to the Prophylaxis of Tuberculosis in Human Beings.)* J. LIGNIÈRES. Bull. Acad. de med., Par., 1919, 82, 301-303.

The expectoration of infected individuals in public places is an important means of disseminating the disease. The sputum of tuberculous people should be disinfected.—G. H. R.

1117. *A Study of the Incidence of Pulmonary Tuberculosis in Soldiers with Irritable Heart.* J. F. KING. Arch. Int. Med., Chicago, 1919, 24, 238-241.

The relation between these two conditions is only accidental.—G. H. R.

1118. *Betrachtungen zur Strahlentherapie der chirurgischen Tuberkulose. (Radiation Therapy in Surgical Tuberculosis.)* OTTO STRAUSS. Deutsche med. Wchnschr., Berl. & Leipz., 1920, 46, 39-41.

The success of radiation therapy in surgical tuberculosis is quite extraordinary. At present, there is no remedial measure that yields such satisfactory results.—B. C.

1119. *Ueber die Sonnenbehandlung der chirurgischen Tuberkulose. (Heliotherapy in Surgical Tuberculosis.)* FRITZ BÄNING. Deutsche med. Wchnschr., Berl. & Leipz., 1920, 46, 5-6.

Heliotherapy is not a specific nor exclusive treatment for surgical (non-pulmonary) tuberculosis, but merely an auxiliary remedy, though quite an important one.—B. C.

1120. *Ein Beitrag zur traumatischen Tuberkulose. (Traumatic Tuberculosis.)* A. WOLFF-EISNER AND L. ZÄHNER. Deutsche med. Wchnschr., Berl. & Leipz., 1920, 46, 124-126.

Tuberculosis following trauma may develop very rapidly and take on all the characteristics of an acute infection.—B. C.

1121. *Beiträge zur Statistik der Lungentuberkulose im Kriege. (Statistics of Pulmonary Tuberculosis in the War.)* ALEXANDER ENGEL. Wien. klin. Wchnschr., 1920, 33, 40-42.

Three-quarters of the men with pulmonary tuberculosis entered the army in good health. Of these, 80 per cent contracted the disease in the field. The other quarter was suffering from the disease on entering the army, and 60 per cent of this group suffered an aggravation of the disease.—B. C.

1122. *Zur Entstehung und zum Verlauf der Lungentuberkulose im Kriege. (Origin and Course of Pulmonary Tuberculosis During the War.)* F. REICHE. München. med. Wchnschr., 1920, 67, 127-128.

The course of tuberculosis in patients who have had manifestations of the disease and recovered earlier in life is remarkably more favorable than in those without such a history. In a general way, those with a hereditary taint seemed to be favorably influenced in the average type of case observed.—B. C.

1123. *Ueber Zusammenhänge zwischen tuberkulöser Infektion und den konstitutionellen Diathesen,—exsudativer Diathese, Spasmophilie, etc. (Relation between Tuberculous Infection and Constitutional Diatheses.)* A. WOLFF-EISNER. München. med. Wchnschr., 1920, 67, 93-94.

A discussion of the clinical manifestations and relations between exudative and proliferative tuberculosis and some constitutional diatheses.—B. C.

1124. *Wege und Ziele der Tuberkulosebekämpfung. (Ways and Aims in the Tuberculosis Campaign.)* H. ULBICH. Berl. klin. Wchnschr., 1920, 57, 103-106.

A discussion of present-day shortcomings in the treatment of tuberculosis.—B. C.

1125. *Meine Heilung von tuberkulöser Spitzenaffektion durch Friedmannsche Injektion. (My Cure of Apical Tuberculosis by Means of the Friedmann Treatment.)* EDGAR BRANN. Deutsche med. Wchnschr., Berl. & Leipz., 1920, 46, 76-77.

A case reported by the patient himself with corroborative remarks by his attending physician. The first Friedmann injection was administered in July. Early in September there occurred an acute exacerbation of the disease for 2 or 3 days, and then there followed a complete change for the better, physically and mentally. Since then cure has been progressive.—B. C.

#### DISEASES OF CHILDREN

(See Numbers 1030, 1031, 1034, 1039, 1164)

#### GYNECOLOGY AND OBSTETRICS

1126. *Ueber die Behandlung septischer Aborte und Geburte mit Argochrom. (Treatment of Septic Abortions and Births with Argochrome.)* ERICH KLEEMAN. Berl. klin. Wchnschr., 1920, 57, 65-66.

Intravenous injections of argochrome (silver-methylene blue) have proven effective in combating threatened bacteremias in septic abortions.—B. C.



## DERMATOLOGY

(See also Numbers 1166, 1167, 1168)

1187. *Meine Behandlung der Trychophytia und Sycosis barbas.* (Treatment of Trychophyton Infections.) J. WETTERER. Deutsche med. Wehnschr., Berl. & Leipz., 1920, 46, 154.

Energetic disinfection with phenol, after cleansing of the infected area, is effective in preventing the spread of the disease. Curettement of the nodules and X-ray treatment are also resorted to in cases where the infection is deep-seated.—B. C.

1188. *Zur Furunkelbehandlung, insbesondere das Auflösen der Haare zur Rezidivverhütung.* (Treatment of Furunculosis, Especially for Preventing Reinfection.) K. WEIGERT. Deutsche med. Wehnschr., Berl. & Leipz., 1920, 46, 128-129.

Reinfection in furunculosis is usually due to infected hair follicles, and a depilatory containing barium sulfide is recommended as a prophylactic.—B. C.

1189. *Case of Shaving-Brush Anthrax of the Face.* G. PERNET. Proc. Roy. Soc. Med., Lond., 1919, 13, Section of Dermatology, 25.

A case report.—G. H. R.

1190. *Pepsin zur äusserlichen Behandlung von epidermalen, kutanen und subkutanen Krankheitsprozessen.* (Pepsin in the External Treatment of Epidermal, Cutaneous and Subcutaneous Diseases.) P. G. UNNA. Berl. klin. Wehnschr., 1920, 57, 77-79.

A pepsin-HCl mixture is included in the medicament with the object of partially digesting the horny layer of the skin and thus permitting the medicament to penetrate to the sites of infection.—B. C.

## OPHTHALMOLOGY

(See Number 1177)

## OTOLOGY AND NOSE AND THROAT DISEASES

1191. *Pneumococcal Ulceration of Pharynx.* BRYAN FOSTER. Med. J. Australia, Sydney, 1919, 6th year, 2, 262-263.

The symptoms suggested either diphtheria or Vincent's angina with ulceration. New areas became involved as older ones healed. Examinations were negative for *B. diphtheriae*, and Vincent's bacillus; a Wassermann was negative. On several occasions the pneumococcus was present in practically pure culture.—C. P. B.

## ORAL BACTERIOLOGY

(See also Number 1122)

1192. *Complement Fixation Tests as Applied to Dentistry.* ANGELO ZABRISKIE. Dental Cosmos, Phila., 1920, 62, 201-205.

The author has complement fixation tests made on all cases of systemic disease referred to him for suspected focal infection in the mouth. In addition to the Wassermann test, tests are made with antigens prepared from gonococci, streptococci, colon bacilli, and other organisms. Several obscure cases have been explained by such tests; for example, a case of arthritis deformans with a positive gonococcus reaction. Another case gave a positive reaction to *B. coli*, leading to the discovery of enteroptosis. Positive streptococcus reactions became negative in 48 hours following the removal of infected teeth.—A. T. H.

1193. *The Bacteriology of Vital Pulp.* A. T. HENRICI AND T. B. HARTZELL. J. Dental Research, Balt., 1919, 1, 419-422.

Cultures were made from vital, apparently normal pulps. Such cultures from 22 normal teeth remained sterile. From 93 teeth with caries, or pyorrhea, or both, positive cultures were obtained in 41. Non-hemolytic streptococci were found most frequently.—A. T. H.

1194. *Teeth and the Worker.* JAMES BURNET. J. Indust. Hyg., N. Y., 1920, 1, 546.

The conditions of ill-health among the workers is frequently traceable to defective teeth. "Much of the money that has been and will be wasted in administrating the National Health Insurance Act (England) might be diverted to subsidizing the medical and dental supervision of factory workers."—D. H. B.

1195. *The Role of Focal Infections in the Psychoses.* HENRY A. COTTON. New York M. J., 1919, 109, 397.

The author points out the necessity of coöperation, especially of the doctor and dentist. He cites the history of several cases indicating that focal infections play a very important part in the etiology of the psychoses.—G. M. S.

## FILTERABLE VIRUSES

(See also Numbers 1013, 1181)

1136. *Further Experiments in the Etiology of Dengue Fever.* J. BURTON CLELAND AND BURTON BRADLEY. J. Hyg., Cambridge, 1919, 18, 217.

Under certain conditions the dengue virus passed through the Pasteur-Chamberland F Filter. The virus may be present in the blood as early as 18 hours after the onset of symptoms and may be present as late as 90 hours after. The authors believe the transmitting agent of the virus is *Stegomyia fasciata*. Guinea pigs and rabbits were injected intraperitoneally and subcutaneously without result. The disease can be transmitted from man to man by injecting blood subcutaneously.—D. H. B.

1137. *Trench Fever; Its Epidemiology and Endemiology.* W. BYAM AND LL. LLOYD. Proc. Roy. Soc. Med., Lond., 1919, 13, Section of Epidemiology and State Medicine, 1-27.

Considerable experimental work on the relation of the body louse to the transmission of the disease is reported. The results show conclusively that lice are infected by feeding upon the blood of trench fever sufferers, that the excreta of lice contains the infective agent and that the presence of the Rickettsia bodies in the intestinal tract or excreta of lice is an indication of the potential infectivity of these insects.—G. H. R.

1138. *Trench Fever in Salonica and France.* H. T. H. BUTT. Med. J. S. Africa, Johannesburg, 1919, 15, 33-50.

The leucocyte count in the cases studied varied between 10,000 to 40,000; the heavier the infection and more severe the symptoms, the greater the leucocytosis. Blood cultures, agglutination reactions with the enteric group, also stool examinations and agglutination with *M. melitensis* all gave negative results. As no spirochetes were seen, Wassermann reactions were not made. Among 170 cases, 11 per cent had had previous attacks, so that immunity, if any exists, must be short. Five forms of the disease are noted.

Atropin was used to differentiate enteric fever.—C. P. B.

## SURGICAL BACTERIOLOGY

1139. *Leçon d'ouverture-faculté de médecine de Paris—Chaire d'Operations et Appareils.* (Opening Discourse—Chair of Surgery and Orthopedics.) PIERRE DUVAL. Presse méd., Par., 1919, 27, 801.

The advances made in France during the war in the surgical treatment of wounds are discussed from the biological standpoint.—L. A. K.

1140. *Contribution à l'étude du rôle des associations microbiennes; les bacilles sporulés aérobies; leur action pathogène probable dans les plaies de guerre.* (A Contribution to the Study of Microbial Associations; Aerobic Spore-Bearing Bacilli, and their Probable Pathogenicity in War-Wounds.) A. R. BARRIEU. Thesis, Univ. Paris, 1919. Presse méd., Par., 1920, 28, 40.

*B. proteus*, and certain spore-bearing aerobes found in wounds, not themselves pathogenic, may by their powerful proteolytic activity exalt the virulence of pathogenic organisms present.—L. A. K.

1141. *Strittige Fragen bei dem toxischen Gasbrandödem.* (Unsettled Questions Regarding Gas Edema.) H. F. O. HABERLAND. Berl. klin. Wehnschr., 1920, 57, 29.

The number of different strains involved, the isolation of their toxins, the reaction of the leucocytes to the infectious agents, the destruction of the red blood cells and the pathological physiology found in gaseous edema are discussed.—B. C.

1142. *Ueber chemotherapeutische Antisepsis. II. Quantitative Untersuchungen zur Tiefantisepsis mit Vuzin.* (Chemotherapeutic Antisepsis. II. Quantitative Investigation of Deep Antisepsis with Vuzin.) J. MORGENROTH AND L. ABRAHAM. Deutsche med. Wehnschr., Berl. & Leipz., 1920, 46, 57-60.

Vuzin (isooctylhydrocuprein) and eucupin (isoamylhydrocuprein) as tissue disinfectants are very effective, and at least 40 to 50 times more so than quinine or optochin (ethylhydrocuprein). These laboratory experiments confirm the results obtained by surgeons in deep wound antisepsis with the substances mentioned.—B. C.

1143. *Ueber Fettplombierung eiternder Knochenhöhlen.* (Treatment of Purulent Bone Cavities by Filling with Fatty Tissue.) O. HEINEMANN. Berl. klin. Wehnschr., 1920, 57, 113.

The treatment is mainly surgical. The wound is opened and the sequestrum removed; and then after complete sterilization of the area, it is plugged with living fat tissue.—B. C.

## SEROLOGY

(See also Numbers 894, 1084)

1144. *Lieu d'origine des anticorps hémolytiques.* (*The Place of Origin of Hemolytic Antibody.*) LÉON MÜLLER. Compt. rend. Soc. de biol., Par., 1920, 83, 203-204.

Guinea pigs were injected with sheep cells until an amboceptor acting 1:500 was produced. These animals were sacrificed and their organs were transplanted into normal guinea pigs. The results showed that transplants of mesentery and spleen conferred the most marked hemolysin production. Bone marrow and thyroid gave less significant results.—G. H. S.

1145. *The "Delayed Negative" Wassermann Reaction.* GUTHRIE MCCONNELL. J. Lab. & Clin. M., St. Louis, 1919, 5, 43-46.

The author calls a "delayed negative" Wassermann one in which the tube containing cholesterinized antigen shows no hemolysis 30 minutes after the addition of the hemolytic system but is completely negative 15 minutes later.

From his analysis of the per cent of such reactions, he is of the opinion that this reaction is of some importance in checking up the results of treatment.—F. W. H.

1146. *The Preservative for Wassermann Reagents.* CLARENCE EMERSON. J. Lab. & Clin. M., St. Louis, 1919, 5, 62-65.

A discussion of methods of preserving some of these reagents. The author recommends the use of a few drops of chloroform for preserving the amboceptor, suspected sera and control sera.—F. W. H.

1147. *Zum Nachweis der Syphilis durch Ausflockungsreaktionen.* (*Precipitin Reactions in Syphilis.*) E. MEINICKE. Deutsche med. Wehnschr., Berl. & Leipz., 1920, 46, 13-14.

Precipitin tests for syphilis require certain optima of concentrations of serum and extract. Positive sera whose precipitin optimum deviates much from the average occasionally give a negative precipitin test and escape detection. This source of error is eliminated by testing the serum with different concentrations of extract.—B. C.

1148. *Zur Methodik des serologischen Luesnachweises mittels Ausflockung durch cholesterinierte Organextrakte.* (*Serological Demonstration of Syphilis by Precipitation with Cholesterinized Organ Extracts.*) H. SACHS. München. med. Wehnschr., 1920, 67, 66-67.

More or less non-specific precipitin reactions occur if the temperature is not controlled. This is avoided if the reaction is allowed to proceed in an incubator for 18 to 24 hours. The results show a very close parallelism with the Wassermann reaction.—B. C.

1149. *Zur Frage der Brauchbarkeit cholesterinierter Organextrakte für die Serodiagnostik der Syphilis.* (*The Utility of Cholesterinized Organ Extracts in the Sero-diagnosis of Syphilis.*) H. SACHS. Deutsche med. Wehnschr., Berl. & Leipz., 1920, 46, 60-61.

Standardized cholesterinization of extracts is a safe procedure in practice for increasing their biological reactivity in the sero-diagnosis of syphilis.—B. C.

1150. *Vergleichende Untersuchungen zwischen den Reaktionen nach Sachs-Georgi und nach Wassermann.* (*Comparative Study of the Sachs-Georgi and Wassermann Reactions.*) TH. MEERSCHMIDT. Deutsche med. Wehnschr., Berl. & Leipz., 1920, 46, 150.

The Sachs-Georgi modification (utilizing a cholesterinized beef-heart extract) agreed with the Wassermann reaction in 85 per cent of over 1100 tests. In the remaining cases both reactions were equally divergent.—B. C.

1151. *Further Observations on the Relation of Aortic Insufficiency to the Wassermann Test.* JULIEN E. BENJAMIN AND SIDNEY J. HAVEE. J. Lab. & Clin. M., St. Louis, 1919, 5, 47-49.

This report of 33 cases of aortic insufficiency uncomplicated by any other organic heart disease from a clinical standpoint, in which Wassermann tests were done, records but 11 per cent of positives. On the other hand, a clear-cut history of rheumatism was obtained in 57 per cent of cases and a questionable history of rheumatism and a history of frequent attacks of tonsillitis in 15 per cent.—F. W. H.

1152. *Sulla produzione di emolisine secondarie nei conigli inoculati con ricina.* (*The Production of Secondary Hemolysins in Rabbits Inoculated with Ricin.*) D. DE BLASI. Ann. d'ig., Roma, 1919, 29, 727.

The injection of ricin into rabbits gives rise to secondary hemolysins. The latter appear at least 24 hours after injection and can be shown only in heated sera. The hemolytic action was shown to be produced by the breaking of red blood corpuscles, and not by traces of ricin in the serum.—P. M.

1153. *Production d'hémolysines chez le lapin par injection des sulfates de terres du group cérique.* (The Production of Hemolysins in Rabbits by the Injection of Sulfates of the Ceri Earths.) ALBERT FROUIN AND S. LEDEBT. Compt. rend. Soc. de biol., Par., 1920, 83, 116-117.

The injection of salts of such elements into rabbits and guinea pigs quickly leads to a diminution in the activity of the complement. Repeated injections (4 to 6) in the rabbit lead to the production of hemolysins, sheep, horse, pig, human. Salts which show the greatest anti-hemolytic action *in vitro* produce the most active hemolysins *in vivo*.—G. H. S.

1154. *Action de quelques sels de terres rares sur la réaction de Bordet-Wassermann.* (The Action of some Salts of the Rare Earths on the Bordet-Wasserman Reaction.) H. GREENET AND H. DRAUIN. Compt. rend. Soc. de biol., Par., 1920, 83, 143-145.

Sulfates of neodymium, praseodymium, samarium, and lanthanum inhibit the activity of amboceptor. Under certain conditions such salts interfere with the fixation reaction in the presence of positive luetic sera.—G. H. S.

1155. *Ueber die Goldsolreaktion im Liquor Syphilitischer, ihr Verhalten zu anderen Liquorreaktionen und ihre klinische Brauchbarkeit und Bedeutung.* (The Goldsol Reaction in Syphilitic Spinal Fluid, its Relation to Other Reactions of the Spinal Fluid and its Clinical Utility and Significance.) J. KYRLE, R. BRANDT AND F. MRAS. Wien. klin. Wchnschr., 1920, 33, 1-6.

The conclusions are based on a study of 720 cases including most of the luetic manifestations. The goldsol reaction of Lange is very frequently positive in the spinal fluid of the syphilitic. This reaction, like the Wassermann, is persistent in the face of energetic therapeutics. It runs parallel with the globulin test but is quite independent of the latter. The goldsol test appears when other reactions fail, but it may fail when others are positive. It is to be considered as a separate phenomenon in the spinal fluid, and independent of all others.—B. C.

1156. *Two Instances of Human Sera showing Abnormal Anti-Complementary Power.* E. K. KENNAWAY AND A. WRIGHT. J. Hyg., Cambridge, 1919, 18, 255.

The amount in one case was about 6 times, and in the other about 4 times, greater than normal.—D. H. B.

1157. *Ueber Varianten des Stammes X 19.* (Variants of the X 19 Strain.) F. WEIL. Wien. klin. Wchnschr., 1920, 33, 61-62.

Experimental evidence tends to show that variants derived from the X 19 strain are to be considered as serologically new organisms standing in the same relation to strain X 19 as is the case with X 2.—B. C.

1158. *Sur l'agglutinabilité des microbes atténués.* (Agglutinability of Attenuated Organisms.) PAUL FABRY. Compt. rend. Soc. de biol., Par., 1920, 83, 201-202.

The cultivation of inagglutinable strains of *B. typhosus* in an alkaline peptone bouillon containing small amounts of phenol renders such strains more susceptible to agglutination.—G. H. S.

## SERUM THERAPY

(See also Number 950)

1159. *Le pronostic des réactions sériques dans la sérothérapie antidiphthérique.* (The Expectancy of Serum Reactions in Antidiphtheric Serum Therapy.) H. GILLARD. Thesis, Paris, 1919. Presse méd., Par., 1919, 27, 800.

Subcutaneous injections only are discussed. A severe reaction on first injection is never seen. Second injections after time for sensitization has lapsed are more severe, but true anaphylactic shock is rare. At shorter intervals, second injections are not severe. Susceptibility to various complications of diphtheria may be increased by injections and their sequelae.—L. A. K.

1160. *Zur Handlung des Tetanus durch kombinierte intrakranielle, subdurale und intraspinal Antitoxininjektionen nach Bets und Duhamel.* (Treatment of Tetanus by Combined Intracranial, Subdural and Intraspinal Injections of Antitoxin.) D. EBERLE. Deutsche med. Wchnschr., Berl. & Leipz., 1920, 46, 94-96.

Experience seems to indicate that in the acute manifestations of tetanus, antitoxin is without appreciable effect. Once the toxin has gained access to the nerve centers, no amount of antitoxin applied directly to the central nervous system can neutralize it.—B. C.

1161. *Serum Therapy in Lobar Pneumonia, with Report of 67 Cases.* GRAHAM E. HENSON. South. M. J., Birmingham, 1920, 13, 178-182.

Cases of Type I received a Type I serum, all other types received a polyvalent serum. The mortality rates were: Type I, 13.5 per cent; Type II, 22.2 per cent. Two cases of Type III both recovered. Type IV, 12 per cent. The author calls attention to the lowering of the rate by the use of Type I serum and he also believes that the use of a polyvalent serum in cases showing the other types of organisms is justified by the results obtained in this series.—J. H. B.

1162. *The Choice of Sera in the Treatment of Meningococcus Sepsis.* M. B. COHEN. J. Lab. & Clin. M., St. Louis, 1919, 5, 176-177.

All available antimeningococcic sera were tested in dilutions of 1-50 to 1-1600 with a suspension of meningococci isolated from the patient. For the further treatment of the case that serum was selected which had the highest titer.—F. W. H.

1163. *The Cure of Cerebro-Spinal Meningitis.* H. STANLEY BANKS. Pub. Health, Lond., 1920, 33, 111-113.

A rapid method of determining by agglutination tests the type organisms (Gordon's four types) by means of the spinal fluid; successful treatment of a few cases by a univalent serum of the determined type is described.—J. B.

1164. *Zur Serumbehandlung der Tuberkulose. (Serum Treatment in Tuberculosis.)* ALEXANDER STRUBELL. München. med. Wehnschr., 1920, 67, 120-124.

An extension of the Deycke-Much theory of partial antigens in tuberculosis. Antigens from the neutral fat and fatty acid lipoids of the tubercle bacillus show a high value in the production of specific antibodies and more labile associated antibodies. The lipoid serum and the neutral fat (nastin) serum have a very strong bacteriolytic effect on the tubercle bacillus, in proportion their antibody content.—B. C.

1165. *Sérothérapie de la fièvre typhoïde-nouveaux faits cliniques. (The Serum Therapy of Typhoid Fever; New Clinical Data.)* A. RODET AND S. BONNAMOUR. Presse méd., Par., 1920, 28, 81.

This work is based on the treatment of 246 cases. The method of preparation of the serum is not mentioned. Early injections of 15 cc. subcutaneously are advised; subsequent injections, if needed, may be decreased in amount. The series includes men and women, civilians and soldiers, of whom some were vaccinated. More than 3 injections were rarely required.

In the first series (soldiers) the total mortality among those treated was 11 per cent; corrected for those succumbing to diseases other than typhoid, it becomes 5 per cent (of whom some were not proved typhoid at autopsy). Among those treated before the 11th day, the mortality was only 2.8 per cent.

The second series was complicated by influenza; among those treated before the 11th day the mortality was 8.4 per cent.

Many temperature curves, and a discussion of the effect of the treatment on all phases of the disease are included.—L. A. K.

1166. *Eine neue Serumbehandlung der Epilepsie. (New Serum Treatment of Epilepsy.)* WILLIAM HELD. Berl. klin. Wehnschr., 1920, 57, 130-123.

Epilepsy is claimed to be due to poisoning arising from inharmonic function of the endocrine glands. Serum treatment to neutralize these auto-toxins is therefore suggested as a rational method for combating the disease.—B. C.

1167. *A New Double-way Syringe for Use in Intravenous Medication, Transfusion, and Aspiration.* H. O. RUM. J. Lab. & Clin. M., St. Louis, 1919, 5, 123-124.

An illustrated article descriptive of the apparatus.—F. W. H.

1168. *Creating a Monopoly.* Editorial. Med. J. Australia, Sydney, 1919, 6th year, 2, 400-441.

The Quarantine Service of the Department of Trade and Customs established laboratories known as the Commonwealth Laboratories, for the preparation of serums and vaccines. This same service published, above Journal, page 438, a list of goods which may not be imported from other parts of the British Empire or from foreign countries. On this list are the preparations which come into competition with the products of the Commonwealth Laboratories.

The monopoly that the government is endeavoring to create for its Serum Laboratories is consequently detrimental to the public health, is damaging to the reputation of the institution itself by rendering it impossible for the Director to demonstrate the relative value of his preparations and a clumsy expedient to enhance the commercial prosperity of a young industry.—C. P. B.

1169. *The Prohibition of the Importation of Bacteriological Products and Sera.* Med. J. Australia, Sydney, 1919, 6th year, 2, 516.

At an extraordinary meeting of the New South Wales branch of the British Medical Association, the following resolutions were passed with reference to the importation of biological products:

(1) That a monopoly of any material necessary for conserving the public health is undesirable;

(2) that it is not yet definitely proved that the products of the Commonwealth Laboratories, are sufficient to meet the many and constantly varying requirements of the community for the treatment and prevention of disease;

(3) that this resolution be conveyed to the Federal Government with the request that the proclamation of November 1, 1919 so far as it relates to bacteriological products and sera, be withdrawn.—C. P. B.

## ANAPHYLAXIS

1170. *Recherches sur l'anaphylaxie au liquide hydatique. (Anaphylaxis with Hydatid Fluid.)* JACQUES PARISOT AND P. SIMONIN. *Compt. rend. Soc. de biol., Par.*, 1920, 83, 154.  
Anaphylactic reactions with hydatid fluid can be demonstrated both in the guinea pig and in the rabbit.—G. H. S.

1171. *Conceptions actuelles sur la nature anaphylactique et le traitement de l'asthma. (Present Views as to the Anaphylactic Nature and Treatment of Asthma.)* PH. PAGNIEZ. *Presse méd., Par.*, 1920, 28, 65.

Asthma may be considered a phenomenon of hypersensibility. A false cardiac, renal or emphysematous type should be differentiated from the true dyspneic asthma. This last may be cured by treating it as an anaphylactoid condition. The work of Walker is especially considered; also that of Auld (*Brit. M. J.*, 1918, July 20).—L. A. K.

1172. *Anaphylaxie à l'antipyrine, apparée après une longue phase de sensibilization. Désensibilization. (Allergy to Antipyrins, appearing after a long Period of Sensitization. Desensitization.)* FERNAND WIDAL AND PASTEUR VALLERY-RADOT. *Presse méd., Par.*, 1920, 28, 93.

Report of a case, in which the drug began to evoke a reaction (labial reddening, swelling and tumefaction) 6 years after its use was begun. After a total period of sensitization of 15 years, it was discontinued; 7 years later, the patient still reacted. Desensitization was accomplished by administering minimal doses, followed 1 hour later by larger doses; after one month's treatment, the patient was cured as observed for 3½ months.—L. A. K.

## VACCINE THERAPY

(See also Numbers 953, 1067)

1173. *Technique de la conservation du vaccin. (Method for Preserving Vaccine.)* M. D'ARSONVAL AND M. F. BORDAS. *Bull. Acad. de méd., Par.*, 1919, 82, 225-227.

The method of desiccation at low temperatures and holding in special tubes is recommended as best preserving the potency of the vaccine virus.—G. H. R.

1174. *L'Immunité et la vaccination antidiphthérique d'après les travaux récents. La Réaction de Schick. (Some Recent Work on Immunity and Vaccination in Diphtheria. The Schick Test.)* M. NATHAN. *Presse méd., Par.*, 1920, 28, 86.

A review of the work of Park and Zingher on the Schick Test, and active toxin-antitoxin immunization.—L. A. K.

1175. *Protective Value of Typhoid Vaccination as Shown by the Experience of the American Troops in the War.* W. S. RANKIN. *Am. J. Pub. Health, Concord*, 1920, 10, 301-305.

Vaccination and sanitation have undoubtedly caused a marked decrease in typhoid in the army, but vaccination cannot be regarded as an infallible procedure.—M. C. P.

1176. *Le lipovaccine antityphoïdique T A B. (Triple Typhoid Lipovaccine.)* A. SÉZARY. *Médecine*, 1919, 1, 164.

The rationale and use of this type of bacterin, including those conditions making its administration dangerous, are briefly described.—L. A. K.

1177. *La vaccination antifurunculeuse. Stock vaccins ou auto-vaccins? (The Vaccine Treatment of Furunculosis. Should Stock or Autogenous Vaccines Be Employed?)* A. MAUTE. *Presse méd., Par.*, 1920, 28, 64.

The best method of preparation of staphylococcus vaccines is to kill with 5 per cent phenol, without heat; unheated vaccines remain antigenic longer than heated; even heated vaccines should be phenolized for assurance of sterility. Five per cent phenol alone will sterilize in from 24 to 48 hours.

In treatment, a stock vaccine, made from a number of strains representing the same clinical condition, should be used at first; intravenous dosage is recommended. When the acute period is past, and a degree of immunity against further attacks is desired, autogenous vaccines, administered subcutaneously, are preferable; patients so treated have fewer relapses, owing to the specificity of the protein antigen.—L. A. K.

1178. *Vaccines in the Treatment of Skin Diseases.* Editorial. *Med. J. Australia, Sydney*, 1919, 6th year, 2, 357.

A summary of the opinions of several dermatologists with reference to the use of vaccines, published in *Brit. J. Dermat. & Syphilis*, April-June, 1919.

All seem to have had good results in furunculosis. In the treatment of impetigo, in the opinion of one writer, brilliant results may be obtained and the results are uncertain or disappointing in acne vulgaris, acne adolescentum, sycosis barbae and tuberculosis cutis.—C. P. B.

1179. *A Polyvalent Vaccine in the Treatment of Bacillary Dysentery in East Africa.* W. H. KNAUTZE. J. Hyg., Cambridge, 1920, 18, 417.

The vaccine employed consisted of:

<i>B. Shiga</i> (3 strains).....	500,000,000
<i>B. Flezner</i> (3 strains).....	250,000,000
<i>B. Morgan</i> (3 strains).....	750,000,000

Each strain was grown separately in peptone bouillon for 72 hours and then killed by the addition of 0.5 per cent carbolic acid. After 48 hours the cultures were tested for sterility. If sterile, the dead cultures were standardized, mixed in the above proportion, and bottled.

On the first day, an initial dose of 2 cc. (3,000,000,000) of the polyvalent dysenteric vaccine was administered, followed by 4 cc. on the fourth day and 8 cc. on the eighth day, if necessary. The results from this treatment were very encouraging.—D. H. B.

1180. *Vaccine Therapy in Genito-Urinary Infections.* JOHN L. LAIRD. Penn. M. J., 1920, 23, 227-229.

Amboceptors are distinctly specific not only to certain groups of bacteria but also to individual members of that group. A good blood supply is necessary in order that antibodies may reach the site of infection. Autogenous vaccines must be so prepared that as little change as possible occurs in the organisms while being grown on culture media, after they are recovered from the site of the infection.

Technic: Secretin, collected after prostatic massage, is planted on blood agar, grown one day, subcultured on same medium and grown one day, growth suspended in saline solution, heated for one hour at 60°C., 0.5 per cent phenol added as a preservative.

Autogenous vaccines properly prepared and administered will eliminate the secondary organisms in genito-urinary infection and are prophylactic against posterior gonorrhea. The vaccine is made to contain 10,000,000,000 organisms per cubic centimeter, and is administered according to a table supplied with the vaccine.—C. P. B.

1181. *Erfolgreiche Behandlung eines Falles von chronischem Nasenrots mittels Autovakzine. (Successful Treatment of a Case of Chronic Glanders by Autogenous Vaccine.)* OSKAR FISCHER. Deutsche med. Wchnschr., Berl. & Leipz., 1920, 46, 73-75.

The case was of 3 years' standing. Agglutination and complement fixation tests were positive, as were also cultural and pathogenicity tests and the mallein eye reaction. An autogenous vaccine was administered, and cure followed.—B. C.

1182. *Erfolgreiche Behandlung eines Falles von chronischem Nasenrots mittels Autovakzine. (Successful Treatment of Nasal Glanders with Autogenous Vaccine.)* KARL ZIELER. Deutsche med. Wchnschr., Berl. & Leipz., 1920, 46, 209-210.

Cure of the hitherto hopeless chronic glanders of the mucosa may be attained by means of active immunisation. A case thus treated is reported.—B. C.

1183. *Die immunisierung gegen Tuberkulose mittels Kaltblütertuberkelbasillen in Tierversuch. (Experimental Immunization of Animals against Tuberculosis with Tubercle Bacilli from Cold-blooded Animals.)* FELIX KLOPFSTOCK. Deutsche med. Wchnschr., Berl. & Leipz., 1920, 46, 6-8.

In attempts to produce active immunization against tuberculosis, almost every known strain of tubercle bacillus derived from cold-blooded animals or passed through them has been employed. From such experiments on animals it seems that prior immunization with such strains retards the course of a tubercle infection but does not protect against a fatal termination. At best, such treatment has but a transitory effect. The Friedmann treatment of bovine tuberculosis by immunization with strains of tubercle bacilli passed through cold-blooded animals has not been confirmed in these experiments.—B. C.

1184. *Klinische Erfahrungen mit dem Friedmannschen Tuberkuloseheilmittel bei Kindern mit chirurgischer Tuberkulose. (Clinical Experience with the Friedmann Cure in Children with Surgical Tuberculosis.)* LUISE AND OTTO BOSSERT. Deutsche med. Wchnschr., Berl. & Leipz., 1920, 46, 41-44.

As a result of a study on 20 carefully selected cases of non-pulmonary tuberculosis in children it is concluded that the Friedmann treatment does not yield as satisfactory results as helio- or radiation therapy.—B. C.

1185. *Fünfjährige Erfahrungen mit dem Friedmann-Tuberkulosemittel. (Five Years' Experience with the Friedmann Tuberculosis Cure.)* DR. DÖRRENBURG. Berl. klin. Wchnschr., 1920, 57, 63-65.

The Friedmann method of treatment has essentially solved the problem of curing tuberculosis, if only the cases are reached early enough in the course of the disease.—B. C.

1186. *Zur Immunisierung gegen Tuberkulose mittels Schildkrotentuberkelbazillen. (Immunization against Tuberculosis by Means of the Tortoise Tubercle Bacillus.)* A. MOELLER. Deutsche med. Wchnschr., Berl. & Leipz., 1920, 46, 150-151.

An acid-fast organism, presumably identical with the Friedmann culture, was isolated from the lungs of a tortoise. Absolute immunization of guinea pigs with the organism against tuberculosis was unsuccessful. There is, however, a slight relative immunization characteristic of the whole group of acid-fast saprophytes.—B. C.

1187. *Sulla terapia specifica delle malattie tubercolari dell'occhio. (The Specific Therapy of Tubercular Diseases of the Eye.)* L. BETTI. Pathologica, Genova, 1919, 11, 400, 477.

Satisfactory clinical results were obtained in using tuberculin for tuberculosis of the eye. The author strongly recommends the practice.—P. M.

1188. *L'azione dell'acido venico, sul virus rabico fisso e la preparazione dei vaccini antirabici fenicati. (The Action of Phenol on Fixed Rabies Virus and the Preparation of Phenolated Antirabic Virus.)* V. PUNTONI. Ann. d'ig., Roma, 1919, 29, 730.

A thorough study has been made of the action of phenol on fixed rabies virus, taking into consideration such factors as concentration of phenol, concentration of nerve tissue, temperature, and method of preparing the emulsion. The action of phenol is variable, depending on its concentration, the trituration and concentration of nerve tissue and the temperature. In general, the greater the concentration of phenol, the greater its attenuating and inactivating action; this action is stronger at higher temperatures and when the nerve tissue is finely ground.

Phenolated vaccines, free from bacteria are made by emulsifying 5 per cent nerve material with a 1 per cent solution of phenol. When a vaccine is made according to Fermi's method, trituration of the nerve tissue for 15 minutes and then keeping at 20° to 22°C., there is noticed a gradual attenuation, until the 6th day, when the virulence disappears entirely. It is possible by this method to obtain rabies vaccine, ranging from avirulence to any desired virulence.—P. M.

1189. *Ueber nervöse und psychische Störungen nach Wutschutzimpfung. (Nervous and Psychic Disturbances after Antirabic Vaccination.)* A. H. HÜBNER. Deutsche med. Wchnschr., Berl. & Leipz., 1920, 46, 121-123.

The disturbances observed are ascribable to the action of the toxin on the brain, and are not to be classed as hysterias.—B. C.

1190. *Immunisatorische Vorgänge bei der Trichophytie des Menschen. (Immunological Reactions in Human Trichophytosis.)* FRANZ BLUMENTHAL AND ASTA V. HAUPT. Deutsche med. Wchnschr., Berl. & Leipz., 1920, 46, 37-39.

In deep-seated trichophytoses there are present in the serum of most of the cases complement-fixing antibodies. These antibodies are rarely demonstrable in superficial infections of this kind. In general, the antibody content runs parallel with the severity of the disease. Injection of trichophytin stimulates antibody production. The reaction is not strictly specific for it sometimes appears in other conditions.—B. C.

1191. *Autovaccinazione in malattie da virus filtrabili. (Autovaccination in Diseases Due to Filterable Virus.)* D. DE BLASI. Ann. d'ig., Roma, 1919, 29, 717.

The author assumed that influenza is caused by a filterable virus, associated with Pfeiffer's bacillus and the streptococcus. He reasoned by analogy from other diseases due to filterable virus, that the causative agent circulated in the blood, at least during the first 3 or 4 weeks. Patients suffering from influenza were bled from a vein in the arm. The blood was allowed to stand at 37°C. for 12 to 15 hours in order to allow the virus to multiply. The serum was drawn off, heated to 55°C. for 45 minutes, and was then inoculated into the same patient from which the blood was drawn. Out of 15 cases, 11 recovered and 4 died. The results are encouraging, although the number of cases is so small as to make it unsafe to draw definite conclusions.—P. M.

## NON-SPECIFIC THERAPY

1192. *Some Uses of Nonspecific Protein Therapy.* WILLIAM BOYD. J. Lab. & Clin. M., St. Louis, 1919, 5, 88-92.

The author found the most suitable cases to be those in which there is a chronic intoxication from some focus of infection which can not be found or removed. His reports are, in the main, from cases of arthritis, neuritis, and iritis in which he used intravenous injections of typhoid bacilli with extremely beneficial effects in most instances.—F. W. H.



## EXPERIMENTAL INFECTION

1193. *Observations on the Artificial Tuberculous Infection of Guinea Pigs through the Respiratory Route.* J. B. ROGERS. *Am. Rev. Tuberc., Balt.*, 1920, 3, 751-753.

Since in former laboratory experiments on the artificial infection of animals with tubercle bacilli no precautions were taken to prevent the organisms entering the mouth and causing infection by ingestion, Rogers wrapped guinea pigs so that only the noses were exposed. A single spraying of 5 minutes with a suspension of tuberculous sputum produced pulmonary tuberculosis in 100 per cent of the pigs exposed. Microscopically localized interstitial cellular infiltrations were found in 24 hours, and by the seventh day tubercles became visible macroscopically in the lungs. When sputum containing the organisms was placed directly on the normal nasal mucous membrane, the bacilli passed through the membrane leaving no trace of passage. They lodged in the cervical lymphatics which always showed tuberculous changes, —the lungs, liver and spleen becoming involved later.—T. G. H.

1194. *L'immunisation antituberculeuse de la mite d'abeille. (Antituberculous Immunization of the Mite of the Bee.)* NOËL FLEISSINGER. *Compt. rend. Soc. de biol., Par.*, 1920, 83, 147-148.

Tubercle bacilli injected into these mites become phagocytosed and altered in certain characteristics, but they are not killed.—G. H. S.

## CHEMOTHERAPY

(See also Numbers 1116, 1132)

1195. *Kritisches zur Salvarsanprophylaxe der Metalues. (Critic of Salvarsan Prophylaxis in Late Syphilis.)* WILHELM MATER. *München. med. Wehnschr.*, 1920, 67, 71.

It is about 10 years since salvarsan therapy was introduced in the treatment of luetics and this period is the interval between the initial appearance of syphilis and the manifestations of tabes. Cases are cited showing that persons apparently cured by vigorous salvarsan-mercury therapy have years later shown tabetic symptoms. A survey of cases treated 10 years ago is urged to show the real effectiveness of salvarsan therapy.—B. C.

1196. *Contribution au traitement des maladies infectieuses par un dérivé argentique soluble, le nitrate double d'argent et de diméthyl diamino méthyl acridine (septacrol). (A Contribution to the Treatment of Infectious Diseases by a Soluble Silver Derivative, the Double Nitrate of Silver and Dimethyl-Diamino-Methyl Acridine (Septacrol).)* M. JEANBETTE. Thesis, Univ. Bordeaux, 1919. *Presse méd., Par.*, 1920, 28, 49.

$C_{15}H_{15}N_5O_4Ag$  is highly bactericidal and leucogenic. It speeds elimination, and, administered in various septicemic conditions, prevents myocarditis and hastens cure.—L. A. K.

1197. *Weitere Mittheilungen über Silbersalvarsan. (Further Report on Silver Salvarsan.)* W. KOLLE. *Deutsche med. Wehnschr., Berl. & Leipz.*, 1920, 46, 33-37.

Silver salvarsan, a silver derivative of diarsenobenzol, has unique and desirable properties from a chemotherapeutic view. The silver does not increase the toxicity of the salvarsan and yet adds the disinfecting property peculiar to silver and its compounds. Substances of the so-called sulfoxylate series are being investigated and show a much lower toxicity than even the new silver-salvarsan.—B. C.

1198. *Silbersalvarsan in der Syphilis-therapie. (Silver Salvarsan in the Therapy of Syphilis.)* F. HAHN. *Deutsche med. Wehnschr., Berl. & Leipz.*, 1920, 46, 92-93.

Silver salvarsan is an excellent agent against syphilis, especially in the early stages. Its use is not so convenient as that of salvarsan or neosalvarsan because of its dark color and low solubility. The technic of administration is also very exacting.—B. C.

1199. *Ueber die Behandlung der progressiven Paralyse mit Silbersalvarsan und Sulfoxylat. (Treatment of Progressive Paralysis with Silver-Salvarsan and Sulfoxylate.)* F. STOLL. *Deutsche med. Wehnschr., Berl. & Leipz.*, 1920, 46, 205-207.

Marked improvement is obtained in luetics by treatment with silver-salvarsan and by sulfoxylate. Most satisfactory results occur in those cases that have not been allowed to become chronic. The permanency of cure can not yet be predicted.—B. C.

1200. *Die Chemotherapie septischer Erkrankungen mit Silberfarbstoffverbindungen. (The Chemotherapy of Silver-Dye Compounds in Septic Infections.)* ERICH LESCHKE. *Berl. klin. Wehnschr.*, 1920, 57, 79-81.

Argochrome (a silver compound of methylene blue) and argoflavin (a silver compound of trypanflavin) are decided improvements over colloidal silver as disinfecting agents in septic infections.—B. C.

1201. *Zwei Jahre Silbersalvarsantherapie. (Two Years of Silver-Salvarsan Therapy.)* E. GALEWSKY. München. med. Wchnschr., 1920, 67, 124-127.

The sodium salt of silver-salvarsan is the strongest salvarsan preparation known, and appears to arouse the fewest side reactions. It is very effective in the early treatment of sero-negative as well as sero-positive syphilis. Early forms of tabes, vascular disease and cerebral syphilis demand special precautions in their treatment with this agent.—B. C.

1202. *On the Effect of Injections of Quinine into the Tissue of Man and Animals.* LEONARD S. DUDGEON. J. Hyg., Cambridge, 1919, 18.

The injection of sulphate and bichloride of quinine into the tissue induces necrosis, more or less extensive, according to the concentration of the preparation.

"No leucocytosis has ever occurred from quinine injections, on the other hand, a leucopenia may develop while an increase of large hyaline cells had been recorded on several occasions."—D. H. B.

1203. *Ueber Steigerung der Chininwirkung durch fluoreszierende Stoffe. (Acceleration of the Effect of Quinine through Florescent Substances.)* STEFAN RUSZNYÁK. Wien. klin. Wchnschr., 1920, 2233, 6-8.

The mechanism of the specific action of quinine on malarial plasmodia is still unknown. The fact that fluorescent substances like quinine and cinchonamine are photosensitizable against frog's eggs and in fermentations suggested the possibility that the effect of the drug might be enhanced through the action of sensitizing fluorescent substances. Experiments were conducted *in vitro* and *in vivo* on the effect of fluorescein and eosin upon quinine when used against the malaria plasmodia. These dyes markedly enhance the hemolytic action of quinine *in vitro*. In the 5 cases of malaria reported there is evident a decided synergy between quinine and eosin or fluorescein.—B. C.

1204. *Ueber kombinierte Chinin-Methylenblautherapie der Malaria. (Combined Quinine-Methylene Blue Therapy in Malaria.)* RUDOLF REITTER. Wien. klin. Wchnschr., 1920, 33, 9-12.

Methylene blue alone is not effective in the treatment of malaria. However, in "quinine-resisting" cases (those that do not respond to quinine treatment) administration of methylene blue is successful against the malarial parasites.—B. C.

1205. *Heilung der Pneumokokkenmeningitis durch Optochin. (Cure of Pneumococcus Meningitis with Optochin.)* GEORG ROSENOW. Deutsche med. Wchnschr., Berl. & Leipz., 1920, 46, 9-10.

A report of a case in which pneumococci were positively identified in the spinal fluid. Two intraspinal injections, six days apart, of optochin sterilized the spinal fluid and produced a cure. The treatment consisted in removal of 25 to 30 cc. of spinal fluid and then injecting 20 cc. of a solution containing 0.04 to 0.06 gm. optochin, (ethyl hydrocuprein).—B. C.

1206. *Heilung eines Falles von Meningitis nach endonasaler Operation eines Hypophysentumors durch Trypaflavininfusionen. (Cure of Post-operative Meningitis by Trypaflavin Infusions.)* GUSTAV SPIESS. Deutsche med. Wchnschr., Berl. & Leipz., 1920, 46, 207-209.

Report of a case in which trypaflavin was injected intravenously with curative effect.—B. C.

1207. *Ueber Behandlung von Staphylokokkenkrankungen mit übermangansaurem Kali. (Treatment of Staphylococcus Infections with Potassium Permanganate.)* ERICH NEUSSER. München. med. Wchnschr., 1920, 67, 17.

A supersaturated solution or suspension of potassium permanganate is applied as hot as can be tolerated, and allowed to dry on the infected surface. Exposure to the sun assists in the curative effect. This procedure has yielded effective sterilization in cases of staphylococcus infection of the skin.—B. C.

1208. *Ueber kombinierte Gold- und Strahlenbehandlung bei der Drüsentuberkulose. (Combined Gold and Radiation Therapy in Glandular Tuberculosis.)* B. ULRICH. Deutsche med. Wchnschr., Berl. & Leipz., 1920, 46, 14-16.

The gold preparation is described as No. 1423 (Kryslogon) of the Höchst Farbwerke, and in the cases reported is claimed to have shown a specific action against tuberculous lymphomas quite as effective as tuberculin. This gold therapy is improved considerably by concurrent Röntgen or quartz lamp radiation. Administration of the gold preparation is recommended in tuberculosis of bovine origin, but is contraindicated in infections caused by the human type.—B. C.

1209. *Chimiothérapie de la tuberculose par le cyanure de cuivre et de potassium. (Chemotherapy of Tuberculosis by Cyanides of Copper and Potassium.)* A.-CH. HOLLANDE AND J. GATÉ. Compt. rend. Soc. de biol., Par., 1920, 83, 178-180.

The action of cyanocuprol of Koga and of a compound prepared by the authors was tested. The two preparations acted in the same manner.—G. H. S.

1210. *Un traitement spécifique de l'angine de Vincent.* (Specific Treatment of Vincent's Angina.)

M. CAPITAN. Bull. Acad. de méd., Par., 1919, 82, 396-398.

Intramuscular injection of 6 cc. of the colloidal arsenic preparation of Fouard has given excellent results in 200 cases of this infection.—G. H. S.

1211. *Protozoölogie and Clinical Studies on the Treatment of Protozoal Dysentery with Benzyl Benzoate.* F. G. HAUGHWOUT AND P. T. LANTIN. Arch. Int. Med., Chicago, 1919, 24, 514-519.

Benzyl benzoate favorably affected the few cases reported in this paper.—G. H. R.

1212. *Beobachtungen über chemotherapeutische Eigenschaften des pikrinsauren Ammoniaks.* (The Chemotherapeutic properties of ammonium picrate.) F. ROSENTHAL AND JOHANNES IMM. Berl. klin. Wchnschr., 1920, 57, 151-154.

Ammonium picrate has a low disinfecting value *in vitro*. It appears to have a slight prophylactic action against trypanosome infection. Against open cases of malaria or trypanosomiasis, it seems to have a very low, if any, degree of effectiveness.—B. C.

### MISCELLANEOUS

1213. *The Lister Institute of Preventive Medicine.* Nature, 1919, 103, 454.

This is a summary of the activities of the Institute during 1918. Through Miss Muriel Robertson's continued researches upon the anaerobic bacteria which infect wounds, the reactions of the bacillus of malignant edema have been worked out, a toxin has been prepared from it, and with the toxin an antitoxic serum has been prepared, which serum was issued to the army.

Sir David Bruce, the chairman of the governing body of the War office Committee for the Study of Tetanus has done valuable work upon this subject. From his analyses of tetanus cases in home military hospitals the following data were obtained. During 1918, 292 cases of tetanus occurred, among 380,000 wounded men, an incidence of 8 cases per 10,000 wounded. During the first three months of the war the incidence was 74 cases per 10,000 wounded. This drop has been chiefly due to the prophylactic use of anti-tetanic serum. The mortality rate has similarly fallen from 58 per cent to 25 per cent.

Mr. Bacot, of the Entomological Department, after numerous experimental tests, brought forth a method for the destruction of lice by a moderate degree of dry heat which was applied practically in the field on a large scale. Large numbers of lice were reared for use in investigations concerned with the transmission of disease, particularly typhus and trench fever.

Dr. Harden and Dr. Zilva, in conjunction with Dr. Still prepared a potent extract from lemon juice for use in cases of infantile scurvy. An investigation on the effects of cold storage on the fat-soluble accessory factor of butter is in progress.

Dr. Chick, in her experimental investigation of scurvy, commenced in 1916, has found that West Indian lime juice is much inferior to lemon juice in the prevention of scurvy. This was surprising; lime juice has been used for the prevention of scurvy by the British navy, by the mercantile marine and in arctic exploration for the last century. Investigation, however, showed that the "lime" juice employed in these circumstances was actually made from lemons. During 1917 and 1918 when there was a scarcity of oranges and lemons, experiments instituted in order to find a cheap substitute containing anti-scorbutic properties resulted in the discovery that juice from the swede (rutabaga) was very effective, in fact not much inferior to orange juice.

The governing body proposes that the institute shall in the future be termed the Lister Institute for Medical Research, and suggests that a research hospital in connection with the institute would add greatly to its usefulness.—Z. N. W.

1214. *Further Studies in Plasmogenesis.* ALPHONSO L. HERRERA. J. Lab. & Clin. M., St. Louis, 1919, 5, 110-113.

A description of a method by which the structures characteristic of protoplasm may be imitated by the use of inorganic materials alone, together with an explanation of these results.—F. W. H.

VOLUME IV

NUMBER 4

# ABSTRACTS OF BACTERIOLOGY

UNDER THE EDITORIAL DIRECTION OF THE  
SOCIETY OF AMERICAN BACTERIOLOGISTS

AUGUST, 1920

EDITOR

A. PARKER HITCHENS



*It is characteristic of Science and Progress that they continually  
open new fields to our vision.—PASTEUR*

PUBLISHED BI-MONTHLY  
FOR THE SOCIETY OF AMERICAN BACTERIOLOGISTS BY  
WILLIAMS & WILKINS COMPANY  
BALTIMORE, U. S. A.

THE CAMBRIDGE UNIVERSITY PRESS  
FETTER LANE, LONDON, E. C.

Entered as second-class matter April 30, 1917, at the Post Office at Baltimore, Maryland,  
under the Act of March 3, 1879

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# PROCEEDINGS OF THE AMERICAN ASSOCIATION FOR CANCER RESEARCH

## TWELFTH ANNUAL MEETING, ATLANTIC CITY

(J. Cancer Research, 1920, 5, 81)

- (1) *Report of the Council.* (p. 81)  
—(2) *Lymphocytes and Cancer Immunity.* FREDERICK PRIME. (p. 82) (See Abs. No. 1392).  
—(3) *The Relation of Pregnancy and Reproduction to Tumor Growth.* MAUD SLYE. (p. 83)  
(See Abs. No. 1393).

1215.—(4) *The Lymph-Nodes in Tumor-Bearing Mice.* WILLIAM H. WOGLOM AND S. ITAMI.  
(p. 85)

This work is an extension of preliminary observations reported by one of us last year. At that time it was said that the lymph-nodes from rats with progressively growing or receding tumors exhibited no deviation from the normal, with the exception, perhaps, of some slight hyperplasia in the germinal centers.

The present series comprises a total of 213 animals—8 mice with spontaneous tumors, 129 mice with transplanted tumors, and 76 rats with transplanted tumors. The tumors were carcinoma, sarcoma, and carcinosarcoma.

It is not easy to establish a normal standard in these animals. Some nodes from supposedly healthy ones show a high degree of endothelial proliferation, others dilatation of the lymph-sinuses, still others a moderate hyperplasia of the germinal centers, and so on. On the whole, however, where a tumor has grown for 5 or 6 weeks an activity of the germinal centers in the lymph-node nearest the growth is sometimes found, and this activity is often somewhat more distinct than in mice without tumors.

The corresponding node on the opposite side is unaffected, whence it may be assumed that the activity is not due to a general systemic change. It is rather to be referred, perhaps, to some such local condition as the presence of a growing tumor, often slightly infected or containing necrotic material. This explanation seemed to us the more probable when we found, by injecting India ink, that the node studied in these experiments (the axillary node nearest the median line) is the one which drains the site at which the tumors were transplanted. Furthermore, nodes near receding tumors show a rather high degree of germinal activity. In any case the differences are slight, and it is not desired at this time to lay any particular emphasis upon them.

The number of nodes from spontaneous tumor mice is too small to serve as a basis for generalization; but it may be said tentatively that some of these nodes show a moderate degree of activity in the germinal centers and that others show little or none.—W. H. W.

1216.—(5) (a) *Concerning the Dosage of Rays.* W. T. BOVIE. (p. 87)

If we look upon radiation as a flow of energy, we may indicate the dose by the total amount of energy absorbed, for it is a general law of photochemistry that the amount of photochemical change produced is, over a wide range of intensities, proportional to the total quantity of radiation absorbed. It easily follows that if the intensity of the radiation absorbed remains constant the amount of photochemical change is proportional to the duration of the exposure. But the intensity of the rays absorbed throughout an absorbing mass is not constant, for, due to spreading and absorption, the intensity decreases as the distance from the source increases, so that as the exposure proceeds equal increments of time do not result in equal increments of photochemical change.

It is impracticable to determine the relationship between the exposure and the amount of photochemical change by mathematical analysis. Using photographic paper, the author has mapped out equi-intensity surfaces about a linear source of radiation, such as a tube of radium emanation, both when the tube is embedded in a highly absorbing homogeneous medium, such as wax, and when only air is the absorbing medium. Intensity surfaces were also mapped out about tubes which were enclosed in the various applicators used in radiotherapy. From the shapes and dimensions of these surfaces, the influence of the volume of the radiated mass upon the amount of absorption was determined, and curves were exhibited showing the relation between the length of exposure and the total amount of photochemical change produced by the radiation.

1217.—(5) *(b) Concerning the Photo-Coagulation of Egg-White.* W. T. BOVIE. (p. 88)

This is a preliminary report upon the influence of the hydrogen-ion concentration upon the coagulation by heat of a 10 per cent solution of egg-white which has been exposed to the ultra-violet radiation from a quartz mercury vapor arc. It was found that the greatest amount of coagulum is formed when the hydrogen-ion concentration of the solution is very close to its isoelectric point, and increasingly smaller amounts of coagulum are formed as the hydrogen-ion concentration is either increased or decreased. Similar non-radiated egg-white solutions showed no coagulum over the range of hydrogen-ion concentrations studied. The temperature of coagulation in these experiments was 18°C.

1218.—(6) *Incision of Tumors and Metastasis.* F. C. WOOD. (p. 88)

In an experimental investigation of the effect of incising the Flexner-Jobling rat carcinoma upon the percentage of metastases, it was found that the incision of the tumor did not increase the percentage of metastases. It is, therefore, probable that the belief among surgeons that such incision necessarily hastens metastasis in human beings must undergo some revision. (Published in full in the J. Am. M. Ass., Chicago, 1919, 73, 764-766.)

—(7) *Basal-Cell Epithelioma of the Rat.* DUDLEY H. MORRIS. (p. 90) (See Abs. No. 1394).

1219.—(8) *Effect of Inoculation Technic upon Percentage of Tumor Takes.* E. G. CARY. (p. 90)

The usual procedure is to wet the skin with 95 per cent alcohol and to insert a large caliber platinum needle carrying the graft under the skin of the abdomen, pushing it into the axilla where the tumor particle is deposited by a trocar. The method has been criticized as leading to bacterial infection of the tumor, but a series of experiments was tried where the skin was prepared in various ways, by epilation, shaving and disinfection, especially with iodine. It was found that no greater percentage of takes could be obtained by such refinements, and that the tumors growing by the ordinary method of implantation are no more apt to contain bacteria than those implanted with the most painstaking surgical technic. It is therefore unnecessary to employ in tumor transplantation any especial means of disinfection of the skin of the animal to be grafted.

1220.—(9) *Arsphenamine and Tumor Growth.* F. C. WOOD. (p. 91)

There is no reason to think that the administration of arsphenamine will stimulate tumor growth, and it is well known that neither it nor compounds of arsenic cause tumors to regress. It is always difficult to judge of the rate of tumor growth in man, even when untreated, and as there have been several instances where patients or their families felt that tumors were stimulated by the giving of arsphenamine, and have threatened legal proceedings, it seemed worth while to conduct a small series of experiments to note the effect of the administration of the drug. A series of mice was inoculated with a tumor, the growth rate of which was known, and the developing neoplasms were carefully measured at regular intervals. Not the slightest difference in growth rate could be detected by careful measurements between those animals receiving none of the drug and those which received varying dosages. It may be concluded, therefore, that arsphenamine neither stimulates nor inhibits tumor growth.

1221.—(10) *Attempt to Influence Tumor Growth.* F. C. WOOD. (p. 91)

Several years ago Benedict stated that the administration of phlorhizin caused the disappearance of the Buffalo rat sarcoma, even when the tumors had grown to large size. His work was repeated by Wood and McLean with negative results. Benedict replied that the reason for this failure to confirm his results was that an insufficient quantity of phlorhizin had been given, and explained that he had used large rats and had periodically suspended the administration of the drug to enable the animals to recover from the toxic effects. The work was therefore repeated by Wood, following Benedict's technic, with negative results, but the findings were not regarded as of sufficient general importance to warrant publication until it was called to our attention that Ewing, in his recent book on neoplasms, has cited Benedict's work as valid. It seems desirable, therefore, to record the fact that these experiments were repeated with phlorhizin from three different makers, and on large animals, the doses being spaced as was done by Benedict. Not the slightest effect was noted on the Buffalo rat sarcoma. It is evident that Benedict's results were due entirely to spontaneous disappearance of the tumor and not to any therapeutic effect of the phlorhizin, thus confirming the published conclusions of Wood and McLean.

—(11) *Pathological Changes Accompanying Injections of an Active Deposit of Radium Emanation.* HALSEY J. BAGG. (p. 92) (See Abs. No. 1395).

—(12) (a) *Fluctuations in Induced Immunity.* (b) *Fluctuations in Concomitant Immunity.* F. D. BULLOCK AND G. L. ROEDENBURG. (p. 95) (See Abs. Nos. 1396 and 1397).

1222.—(13) *Malignancy of the Crown Gall and Its Analogy to Animal Cancer.* ISAAC LEVIN AND MICHAEL LEVINE. (p. 97)

Previous investigations of the writers have indicated that the crown gall presents an ideal material for the cellular study of the cancer problem. It appeared imperative, therefore, to estimate the true relationship between the crown gall and animal cancer, and this



was the object of the present investigation. A large number and a great variety of plants were inoculated by Dr. Smith's method. The research shows that certain of these plant-tumors behave, both morphologically and biologically, as benign growths; while others, inoculated in the same manner, appear to be true malignant tumors. Certain phases of the development of these tumors resemble granulomata as near as an organism devoid of blood or lymph circulation may do so. In accordance with the findings of Dr. Smith a number of crown galls were obtained containing leafy shoots.

The microscopical study of the material revealed conditions which differ materially from the conditions obtained in animal cancer. Usually the entire gall presents a uniform morphological appearance of small, young, undifferentiated cells. In other galls the central growing part presents the usual appearance of a crown gall, while the periphery shows the development of adult differentiated tissue (parenchyma), rudimentary organs (conducting system), or even a whole rudimentary organism (leafy shoot).

The conclusion to be derived from this study is that a rapidly developing simple crown gall presents considerable analogy to animal cancer, and offers an ideal material for the cellular study of the latter condition. On the other hand, the structure of the growing central part of the crown gall does not change with the structure of tissue inoculated. It represents, therefore, only one form in the large group of pathological growths designated under the name of cancer. Until it can be demonstrated that the same microorganism may produce a crown gall with an entirely different morphological structure derived from a selected tissue it cannot be asserted on the basis of this study that one parasite must be the cause of all human cancer.

1223.—(14) (a) *Tissue Transplantation and the Lymphocytic Reaction.* LEO LOEB. (p. 102)

In the case of homoiotransplantation of various tissues a lymphocytic reaction appears around the transplant, which is absent in the case of autotransplantation.

This reaction is a graded one, and indicates the relationship between donor and host. In case of transplantation into near relatives (from brother to brother) the reaction appears later than in the case of transplantation into individuals who are not related to each other. The degree of strangeness of the substances produced by different members of the same species varies in accordance with the degree of relationship between host and donor, and the lymphocytes sense these differences. The reaction of lymphocytes which is elicited through homoio- or syngenesioplasmic transplantation is a primary reaction of the lymphocytes and not a reaction caused by immune substances.

The fibroblasts and capillary vessels are also specifically influenced by syngenesiotoxins and homoiotoxins. In the case of homoiotransplantation fibroblasts are attracted strongly by the transplant, while capillaries are attracted only weakly. The reverse condition holds good in autotransplantation. In syngenesiotransplantation the conditions are somewhat intermediate, but on the whole, especially so far as practical results are concerned, syngenesiotransplants approach more closely homoio- than auto-transplants. The reactions called forth through immunization against homoio-tumors resemble closely those found in the case of homoiotransplantation of normal tissues.

1224.—(14) (b) *The Invasion of Blood Vessels by a Normal Tissue Transplant.* LEO LOEB. (p. 103)

Regenerating tissue may show many characteristics of cancer tissue. We have recently had an opportunity to observe even the penetration of newly formed capillaries by regenerating strands of thyroid tissue. From here the invading tissue was carried to arteries, and within the lumen of the latter relatively large quantities of this tissue became fixed to the wall of the vessel and sheathed in by endothelium. The invasion of capillaries was not confined to one place, but occurred in several vessels simultaneously. The invading tissue not only remained alive in the vessel wall, but continued to proliferate mitotically.

This observation was made in a case of autotransplantation, seven days following the implantation.

While regenerating tissue may in certain important aspects closely resemble cancer tissue, still it would be false to conclude that cancer tissue is merely normal regenerating tissue which continued to proliferate because it did not make proper connections with its own kind of tissue.—W. I. W.



## ABSTRACTS OF BACTERIOLOGICAL LITERATURE

### CHARACTERIZATION AND CLASSIFICATION

(See also Numbers 1322, 1460)

1225. *Versuch einer natürlichen Gruppierung der Bakterien.* (An Attempt at a Natural Classification of Bacteria.) OTTO RAHN. *Centralbl. f. Bakteriologie* (etc.), Jena, 2. Abt., 1920, 50, 273-293.

An attempt is made to classify bacteria according to their natural relationships, since the methods used in the systematic study of higher plants have given unsatisfactory results when applied to the study of bacteria. This is due to the fact that many of the transition and intermediate forms of bacteria are still existing, while in the case of sexually reproducing plants they have died out. Instead of separating the related forms, the similarity of various species is pointed out. The transition forms which have been put aside in the old systems, since they interfered with the uniform impression of the system, are here brought forward and are properly interpreted, so that it is possible to demonstrate the transition, similarity and relationship of many bacterial species. Nearly all the bacteria described in Lehmann and Neumann's "Diagnostic" are thus naturally separated into 3 groups: (1) spore forming rods; (2) the non-spore forming rods (including streptococci), and (3) the micrococci. All the species within each group are closely related and many species are interrelated by a number of intermediate forms. All the generic and specific names of bacteria, as well as their descriptions, can remain in this system of bacterial relationship, so that new entanglement in the naming of bacteria is not to be feared.—S. A. W.

1226. *Studies in the Heat Resistant Organisms of Cold Packed Canned Peas.* RUTH NORMINGTON. *Mich. Agr. Exper. Sta., Tech. Bull.* 47, 33 pp., 1919.

"The lowest percentage of spoilage was found in peas processed in the autoclave. Peas canned immediately after shelling had a comparatively low percentage of spoilage. The organisms found were all spore forming bacilli. All organisms withstood from 10 to 15 pounds pressure in the autoclave for 10 to 20 minutes. Nearly all organisms reduced starch to sugar. Seven of these organisms caused peptonization in milk. But one organism found failed to produce indol from peptone. Eight of the organisms found in canned peas produced gas in sterile peas but not in other media. *B. subtilis*, *B. ramosus*, *B. ruber*, *B. prodigiosus*, and *B. viscosus* produced gas in peas but not in other media. This fact suggests additional possibilities in differential identification tests."—R. S. B.

1227. *Über Bakterien, welche die fraktionierte Sterilisation lebend überdauern.* (Bacteria which Persist after Fractional Sterilization.) ELISABETH ECKELMANN. *Centralbl. f. Bakteriologie* (etc.), Jena, 2. Abt., 1918, 43, 140-178.

A study was made to determine whether or not microorganisms persisted after fractional sterilization as a result of spores not having germinated and been killed during the 3-day interval, or as a result of the ability of the organism to produce spores within 24 hours. The question was also investigated as to what method might be used to alter the fractional sterilization so that all microorganisms would be destroyed. Inoculations were made from soil in a variety of localities, into 1 per cent peptone broth, sterilized in streaming steam on 3 successive days for 20 minutes each. Not all soils showed bacteria which were difficult to kill. The original assumption that soils which lacked such bacteria were perhaps acid was found not to be tenable. The organisms found resembled each other in many respects, belonging to a well marked physiological group. Probably in most cases the organisms resist because the spores germinate but slowly. Occasionally new spores are formed within the 24-hour period elapsing between heatings. It was found necessary to sterilize on 7 successive days at 100° in order certainly to kill the spores. The great resistance of the spores of such bacteria is due to the slight permeability of the membranes. Repeated growth and inoculation of these organisms in a liquid medium gradually reduced the resistance of the spores in from 2 to 5 months. This did not occur on solid media. When the spores were dried on soil, sand or clay they regained their resistance in a few weeks. Diminution of oxygen tension markedly reduces the ability to germinate. The spores are not injured by the lack of oxygen, but germination merely is prevented. Some 28 distinct forms of bacteria were described. Practically all were rod-shaped bacteria; frequently when growing upon potato or other starchy media, showing a red coloration.—R. E. B.

1228. *Technique d'identification des germes pyocyaniques.* (Technic of the Identification of Strains of *B. pyocyanus*.) C. GESSARD. *Ann. de l'Inst. Pasteur, Par.*, 1920, 34, 88-97.

Organisms of the pyocyanus group are divided into 4 chief varieties, with 4 "races" in each variety. This elaborate subdivision is based upon the type of pigment formation of

various strains of *B. pyocyaneus* when grown on bouillon, peptone water, glycerin peptone water, and an agar or gelatin glycerin peptone medium.

*B. pyocyanoides* is the name given to an organism having serological and general cultural characteristics of *B. pyocyaneus*, but which does not form pyocyanin.—S. B-J.

1229. *Zur Frage des Zellkernes der Bakterien.* (The Question of Cell Nuclei in Bacteria.) EUG. PARAVICINI. Centralbl. f. Bakteriologie. (etc.), Jena, 2. Abt., 1918, 48, 337-340.

The author notes that most studies on the cytology of bacteria have been with cultures dried upon a cover glass or a slide. He urges that such cannot be properly fixed and results are not dependable. In an investigation of *Bacillus mycoides*, *Bacillus megatherium* and *Bacterium aerogenes*, the author secured with iron hematoxylin stain, pictures which he concluded differed from those of the chromatin granules, and which would be recognized as nuclei. This conclusion was based upon the relative size of nucleus and bacterial cell, the position in the bacterial cell, the behavior of the nucleus in spore formation and in cell division, and its relationship toward dyes. With those species which form spores each cell contains a single nucleus. In those which do not form spores, on the other hand, there are more. In the species investigated usually six were present. In the process of spore formation the protoplasm surrounds the nucleus and then produces the membrane. In cell division each nucleus divides into two daughter nuclei which then pass into the daughter cells.—R. E. B.

1230. *Ein Beitrag zur Kenntnis der Actinomyceten.* (A Contribution to Our Knowledge of Actinomycetes.) ALEXANDER BRUSSOFF. Centralbl. f. Bakteriologie. (etc.), Jena, 2. Abt., 1919, 49, 97-115.

The author has isolated a species of Actinomyces from the sediment of the Aachen sewage disposal system. An investigation was made of the power of this material to transform cellulose. Particular attention was called to the constant development upon pieces of filter paper of characteristic concentric ring shaped colonies. These were isolated and studied in detail. The principal species found was named *Actinomyces cloacae*. The organism was grown upon a great variety of culture media and its power to digest cellulose carefully studied. The development of mycelium, formation of chains of spherical conidia are described and figured. He finds that the assumption that Actinomyces hyphae break into fragments, rests on erroneous observations in colored preparations. No fragmentation actually occurred in Actinomyces hyphae. The cocci, rods, and spirilla of various authors are nothing more than drops and aggregations of drops of volutin.—R. E. B.

#### NEW SPECIES

(See also Numbers 1267, 1478, 1493)

1231. *Über eine stäbchenförmige, kalkspeichernde Eisenbakterie aus dem Klärschlamm einer biologischen Abwasserkläranlage.* (A Rod-Shaped, Calcium Precipitating, Iron Bacterium from the Sludge of a Biological Sewage Disposal Plant.) A. BRUSSOFF. Centralbl. f. Bakteriologie. (etc.), Jena, 2. Abt., 1918, 48, 193-210.

A rod-shaped, motile, spore-bearing organism, named *Ferribacterium calcium*, is described from a sewage disposal plant. The organism grows in nutrient solutions simultaneously in an iron-free and an iron-precipitating form. The sporeless individuals have the shape of short or long rods, in pairs and more or less elongated, straight or irregularly bent chains. The iron-free individuals grow free in the solution and on the walls of the culture vessel, while those depositing iron produce a scum on the surface of the nutrient medium. This film is metallic, either covering the whole surface or forming islands upon it. The film by transmitted light appears more or less intensely yellow to red-brown. Microscopically the ground mass of the film appears homogeneous, in which lie embedded numerous small, glittering, granules and bacteria. In young cultures the forms precipitating iron have regular contours and are differentiated from those which are iron-free only through their yellow color and thick, definitely visible membrane. In old cultures the bacteria depositing iron are quite irregular and show variable contours. Apparently each individual has three portions; a darker inner portion, a golden membrane, and a sharp, limited, dark peripheral line around this. Both young and old cells show upon treatment with red or yellow blood alkaline salts and hydrochloric acid an intensive blue coloration. Treatment with hydrochloric acid dissolved out the iron and the bacteria revealed are rather similar both in the sporulating and non-sporulating forms, to the iron-free bacteria. The organism does not grow well in pure mineral solutions. It develops well in a variety of organic substances. It will develop in nutrient solutions containing no iron compound. Manganese forms may be secured identical with those produced with iron. Calcium may also be deposited as a white, coherent film. The organisms are then colorless and show a greater irregularity of contour than with those depositing iron.—R. E. B.

1232. *Untersuchung eines aus Rahm isolierten Säure-Labbildenden Bazillus (Bacillus coagulans n. sp.).* (Studies of a Bacillus Isolated from Cream Capable of Producing Acid and Forming Lab (Bacillus coagulans n. sp.).) A. E. SANDELIN. Centralbl. f. Bakteriologie. (etc.), Jena, 2. Abt., 1919, 49, 115-130.

The organism was isolated from a Swedish establishment for the homogenization and sterilization of cream. The organism is a spore-producing rod, with peritrichic flagella,

facultative anaerobic. It coagulates milk with a slightly acid reaction in a very characteristic manner, whereupon the coagulum is peptonized by the formation of peptone and amino compounds. Dextrose, fructose, galactose, maltose and lactose were fermented. In the fermentation of lactose and dextrose some acetic and succinic acids are formed. Lactic acid and oxalic acid are not formed. The fat of the milk apparently is somewhat attacked. Gelatin was liquefied.—R. E. B.

1233. On a New Saccharomycete, *Monosporella unicuspidata* gen. n. nom., N. sp., Parasitic in the Body Cavity of a Dipterous Larva (*Dasyhelea obscura* Winnertz). D. KEILIN. Parasitology, Lond., 1920, 12, 83-91.

The generic name *Monosporella* given by Metschnikoff to the parasite upon which he did his early work on phagocytosis was preoccupied and hence the name *Monosporella* is proposed. The new species is distinguished by the fact that its spores are pointed at one end, truncated at the other.—W. A. R.

1234. Eine saprophytische Oscillarie im Darm des Meerschweinchens. (A Saprophytic Oscillatoria in the Intestines of the Guinea Pig.) HELLMUTH SIMONS. Centralbl. f. Bakteriologie (etc.), Jena, 2. Abt. 1920, 50, 356-368.

The author has isolated an oscillatoria from the intestines of a guinea pig and describes its morphological and physiological characteristics.—S. A. W.

1235. Mallophaga from South African Birds. Descriptions of a New Genus (*Neomonopon*) and Two New Species (*Machaerilaemus plocei*, *Neomonopon pteroclorus*). G. A. H. BEDFORD. Parasitology, Lond., 1920, 12, 167-172.

The scope of the paper is indicated by the sub-title. The first named species was collected from "a wax bill," the second from *Pteroclorus namaqua*, a sandgrouse.—W. A. R.

1236. On a Filaria, *Loa papionis* n. sp., Parasitic in *Papio cynocephalus*. C. H. TREADGOLD. Parasitology, Lond., 1920, 12, 113-135.

The yellow baboon from French Guinea was found frequently to harbor a filarial worm to which the name *Loa papionis* was given. The intermediate host was not discovered. The larvae did not exhibit diurnal periodicity.

Evidence of both traumatic and toxic action of *L. papionis* on baboons was obtained. Adult baboons from an infected area seem to possess a high degree of immunity both against *Loa papionis* toxemia and against reinfection.

Careful descriptions of the larvae are given, followed by a consideration of imperfectly solved morphological problems, relating especially to the buccal apparatus and to the genital and excretory cells.—W. A. R.

1237. A Parasitic Spiral Organism in the Stomach of the Cat. R. K. S. LIM. Parasitology, Lond., 1920, 12, 108-112.

Describes a parasitic spiral organism averaging 4-8 $\mu$  long, with regular closely set spirals about 0.75 $\mu$  broad, which was found in the lumina of ducts and glands, and within the oxyntic cells of the stomach of cats. They were extremely active and stained readily by anilin dyes. The mode of infection is unknown.—W. A. R.

1238. Sclerostomes of the Donkey in Zanzibar and East Africa. C. L. BOULENGER. Parasitology, Lond., 1920, 12, 27-32.

Two small collections yielded nine species of which two, *Strongylus asini* and *Cylicostomum adersi*, are described as new.—W. A. R.

1239. On Fahrenholz's Purported New Species, Sub-Species and Varieties of *Pediculus*. G. H. F. NUTTALL. Parasitology, Lond., 1920, 12, 136-153.

Fahrenholz supports the contention of some of the earlier investigators that lice occurring upon various races of man constitute distinct sub-species. His conclusions are criticized on the grounds, (1) that measurements of lice are subject to error on account of drying of and consequent shrinkage of the insect or, on the other hand, swelling in certain fluids. Still greater variations may be dependent upon the amount of gorging; (2) that morphological characters described intergrade to such a degree as to be valueless; (3) that the worst blunders are due to relying upon pigmentation. By raising unpigmented strains of European *P. humanus* on a black back-ground, the "absent" characters of Fahrenholz are rendered visible, and by raising pigmented lice on white backgrounds, all of Fahrenholz's specific characters may be made to disappear.—W. A. R.

1240. On Some Nematode Parasites of the Zebra. C. L. BOULENGER. Parasitology, Lond., 1920, 12, 98-107.

A small collection of Strongyles from the zebra, collected in Nairobi, British East Africa, included representatives of eight species. Of these *Cylicostomum zebrae*, and *Cylicostomum montgomeryi*, are new, while a third, *Craterostomum tenuicauda*, is not only new, but is the type of a new genus. This genus is closely allied to *Tridontaphous*, but differs from it by the absence of teeth projecting into the mouth capsule.—W. A. R.

1241. *Un champignon pathogène nouveau, du genre "Scopulariopsis," isolé d'un pus de plaie de guerre.* (A New Pathogenic Yeast of the Genus "Scopulariopsis" Isolated from a War Wound.) A. SARTORY. Bull. Acad. de méd., Par., 1919, 81, 783-784.

This organism grew on all culture media at an optimum temperature of 28 to 30°. It liquefied gelatin in 5 days, coagulated milk in 10 days, with subsequent peptonization, and fermented only dextrose and maltose. This organism is pathogenic for rabbits and guinea pigs. The serum of animals which have been immunized will agglutinate the spores at a dilution of 1 to 200. This is believed to be a new species of the genus *Scopulariopsis*.—G. H. R.

## BACTERIAL NUTRITION AND METABOLISM

(See also Numbers 1271, 1272, 1273, 1274)

1242. *By What Steps Does Azotobacter Fix Nitrogen.* D. D. WAYNICK AND WOODHOUSE. Cal. Agr. Expt. Sta., Ann. Rpt., 1918-19, 62-63.

It has been shown that a large percentage of the total nitrogen fixed during the first few days of growth of *Azotobacter* in culture consists of amino-acid nitrogen, thus indicating that the nitrogen goes through the simple organic forms before being made into protein nitrogen. It also indicates that the nitrogen is fixed by combination with hydrogen and not with oxygen which, from the standpoint of energy makes it more efficient than the electro-chemical processes. It is stated that not sugar but its products of decomposition form the true source of energy for *Azotobacter*.—J. M. S.

1243. *On the Spirochaeta-like Bodies Appearing in the Culture of Certain Species of Bacteria.* G. KOGA AND I. OTSUBO. Kitsato Arch. Exper. M., 1919, 3, 207-222.

Koga and Otsubo cultivated anaerobically several species of motile bacilli, which possess flagella in plasma-ascites medium, Noguchi's ascites tissue agar medium and Shimamine's horse-serum medium and succeeded in obtaining spirocheta-like bodies which are almost identical morphologically with spirochetes. These spiral bodies were not produced in similar cultures of cocci. The cultures of bacilli which produced these spirocheta-like bodies were *B. subtilis*, *B. typhi*, *B. paratyphi* A and B, etc. The *B. mallei*, which was believed to be non-motile, was found to possess flagella and also produced the spiral bodies.

The spirocheta-like bodies may be divided into two groups according to the width of the spirals, "macrospirocheta-like bodies" with "weak" spirals, the width of wave being 2-3 $\mu$ , and "microspirocheta-like bodies" with very sharp spirals, the width of wave being 1-1.5 $\mu$ . The spiral bodies divide by longitudinal division. They do not stain by anilin dyes, by carbol-fuchsin, aniline-water gentian violet, Giemsa's stain, etc. They only take Loeffler's flagella stain and Zitrow's silver stains. They lack motion. They are very resistant to heat, resisting 85°C. for one hour and 90°C. for 30 minutes, and also to disinfectants. In suitable culture media they develop rapidly, but never grow on plain agar. On account of their lack of motion, staining reactions, resistance to heat and disinfectants and rapid growth, the authors believe that the spiral bodies are not spirochetes. They believe they are transformation products of either flagella or bacillary bodies.—R. T.

1244. *Delle mutazioni che presentano i bacilli acido-resistenti nel passaggio attraverso gli animali.* (Mutations Presented by Acid-Fast Bacilli in Passing through Animals.) F. SANFELICE. Ann. d'ig., Roma, 1920, 30, 1-7.

Certain acid-fast bacteria, when passed through animals, are capable of adapting themselves to a parasitic life. They can no longer be grown at room temperature, but only at 37°C. and acquire all the morphological and cultural characteristics of *B. tuberculosis*.—P. M.

1245. *Notiz über das Vorkommen von Volutin bei Azotobacter chroococcum.* (Note on the Presence of Volutin in *Azotobacter chroococcum*.) EARNST WILLY SCHMIDT. Centralbl. f. Bakteriöl. (etc.), Jena, 2. Abt., 1920, 50, 44-45.

Volutin is found abundantly even in young cultures of *Azotobacter chroococcum*.—S. A. W.

1246. *Über Kolonien mit Wachstum in einseitswendigen Spiralen.* (Colonies Whose Growth Shows Formation of Spirals in a Definite Direction.) E. PRINGSHEIM. Centralbl. f. Bakteriöl. (etc.), Jena, 2. Abt., 1918, 28, 513-515.

Attention is called to the fact that colonies of some bacteria, particularly *Bacillus mycoides*, show the bacterial growth in definite counter-clockwise spirals. A satisfactory explanation of this phenomenon is not afforded.—R. E. B.

## PHYSICAL CHEMISTRY

1247. *Reduction Potentials of Bacterial Cultures and of Water-Logged Soils.* L. J. GILLESPIE. Soil Sc., Balt., 1920, 9, 199-216.

Measurements of the reduction potentials of bacterial cultures or suspensions showed constant potentials for the facultative anaerobe, *B. coli* and for mixed cultures of soil micro-organisms grown on a deep layer; the values for the reduction potentials being near the hydrogen electrode potentials. Measurements with aerobes (*B. subtilis*, *B. mycoides*, and a third

aerobe) showed progressively increasing reduction potentials with lapse of time, but in no case did the reduction potential approach the hydrogen electrode potential as closely as 0.3 volt. It is thought that this difference between anaerobes and aerobes may hold in general, but the evidence is not conclusive.

When Hagerstown, Caribou and Washburn loams were treated with an excess of water they became highly reducing as evidenced by their reduction potentials and in most cases produced a foul odor. At the same time their hydrogen electrode potentials changed. In the cases noted, the changes of hydrogen ion exponent indicated by the hydrogen electrode potentials were very considerable, the soils becoming less intensely acid. Different soils differed in the rate at which they became highly reducing. The addition of dextrose to one soil favored the development of reducing conditions, the effect of 0.1 per cent of dextrose being very pronounced. It is thought that "sourness" of soils includes something beyond acidity and that the residual unfavorable quality may be a high intensity of reduction. A discussion is given of the significance of reducing conditions and of reduction potentials in soil study, accompanied by a bibliography of 40 references.—N. K.

1248. *Acidity Relations of True Lactic Acid Bacteria.* O. SVANBERG. Midd. K. Vetenskapsakad. Nebelinst, 1919, 5, 10 pp.

Acidity relations were determined for two groups of lactic acid bacilli, *Streptococcus lactis* and *Bacterium casei*. The final pH reached by *Strep. lactis* (in milk and whey) is 4 at 16°; by *Bact. casei* (in milk and wort) pH = 3 at 35°. When pH is established by H<sub>2</sub>SO<sub>4</sub>, HCl, or H<sub>3</sub>PO<sub>4</sub>, the limiting values are, *Strep. lactis*, pH = 3.4; *B. casei*, pH = 8. A reaction of pH = 8 inhibits the growth of *Strep. lactis*, and pH = 7 that of *B. casei*. At low lactate concentrations the H-ion concentration is the limiting factor for growth; as lactate concentration becomes greater it also limits growth.

The lethal concentration of undissociated lactic acid is ten times as great for *B. casei* as for *Strep. lactis*. (Chem. Abstr., 1920, 14, 1694.)—L. A. R.

1249. *Deterioration of Crystalline Strophanthin in Aqueous Solution. Its Relation to Hydrogen Ion Concentration and a Method for its Prevention.* R. L. LEVY AND G. E. CULLEN. J. Exper. M., N. Y., 1920, 31, 267-273.

Wide variations in the potency of various commercial preparations of ouabain (G-strophanthin), as determined by the cat method of Hatcher and Brody, were found in great measure to be due to a marked increase in alkalinity of the contents of many of the glass ampules after autoclaving, causing a change in reaction of distilled water from pH 6.0 to pH 9.0 and resulting in a partial decomposition of the drug, as evidenced by a change in optical rotation, and by rendering it biologically inert.

It is recommended that the crystalline strophanthin be dissolved in a buffer, e.g., 0.02 M standard phosphate solution at pH 7.0, and marketed in hard glass ampules, thereby insuring stability of reaction with preservation of biologic activity.—W. P. B.

## BACTERIOLOGICAL TECHNIC

1250. *Traumatic Hemolysis and the Syringe Method of Blood Collection.* C. E. RODERICK. J. Lab. & Clin. M., St. Louis, 1920, 5, 457-458.

The author finds that with a properly prepared syringe laking rarely results. The syringe if not used dry should be moistened with normal salt solution and the needle should be removed before expelling the blood.—F. W. H.

1251. *A New and Easy Method for Demonstrating Spirochaeta pallida.* S. D. COFFIN. J. Am. M. Ass., Chicago, 1920, 74, 1457.

The method with illustrations is given in detail.—P. G. H.

1252. *I. Estimation of Carbon Dioxide, Oxygen and Combustible Gases by Krogh's Method of Micro-Analysis.* HANS OLUF SCHMIDT-JENSEN. Bio-Chem. J., Lond., 1920, 14, 4-24.

An adaptation of Krogh's method of micro-analysis for the study of respiratory processes of small organisms and for other biological processes is described. The original method is amended by the use of colloidal palladium plus sodium picrate for the estimation of hydrogen, and a solution of acid cuprous chloride for the determination of carbon monoxide. A description is also given of a micro-receiver for small gas samples.—R. E. B.

1253. *A Simplified Plate Method of Partial Oxygen Tension in the Cultivation of the Gonococcus.* RUSSELL D. HEROLD. J. Am. M. Ass., Chicago, 1920, 74, 1716.

Two inoculated plates, one with the gonorrheal material, and the other with *B. subtilis*, are placed together with the sides facing each other. Then a closed rubber band 2½ inches wide by 3½ inches diameter encircles both, enclosing the edges but allowing aerial communication between them. Of a variety of mediums used, nutrient bactoveal agar gave the best growth. Dibasic potassium phosphate was substituted for sodium chlorid.—P. G. H.

1254. *Sulle odierne applicazioni del metodo di colorazione Fontana-Tribondeau.* (Fontana-Tribondeau Method of Staining and its Present Applications.) A. FONTANA. *Pathologica*, Genova, 1920, 12, 13-21.

In able hands the Fontana-Tribondeau method for staining spirochetes may give excellent results in the study of other organisms, especially those whose morphology is yet uncertain.—P. M.

1255. *Eine Modifikation des Färben mit Hämatoxylin, Cochenille, und Karmin. Ein neues Aufhellungsmittel.* (A Modification of the Staining with Hematoxylin, Cochineal, and Carmin. A new Clearing Medium.) B. RAWITZ. *Virchow's Archiv. f. path. Anat.* (etc.), Berl., 1920, 227, 223.

In place of ammonia alum, sodium thiosulphate is suggested; after ammonia alum, tincture of cochineal, 5-10 drops in 20-30 mils distilled water, for 24 hours. Acid carmin and carmin are used similarly after ammonia alum or sodium thiosulphate. For clearing, oil of thyme is preferred following dehydration in 95 per cent alcohol.—S. A. G.

1256. *Neue Methode der Zählung von Mikroorganismen, um verschiedene Arten in etwa gleicher Zellenzahl zur Aussaat zu bringen.* (New Method for the Enumeration of Microorganisms in Order to Approximate the Number of Cells in Material used for Feeding.) HEINRICH ZIKES. *Allg. Ztschr. f. Bierbr. u. Malzfabr.*, 1919, 47, 329.

The author describes a method of securing counts of suspensions of organisms by use of diluted ink. These droplets of ink are placed as in the Burri method of single cell culture upon the surface of gelatin.—R. E. B.

1257. *Modern Dark-field Microscopy and the History of Its Development.* SIMON H. GAGE. *Tr. Am. Micr. Soc.*, Menasha, 1920, 39, 95-141.

A discussion of the principles underlying dark-field microscopy as distinguished from "bright-field" work. Detailed descriptions of the various methods of work together with the various equipment which may be used. This is followed by a historical sketch of the development of this line of work.—J. H. B.

1258. *Alles und Neues über die Riesenkolonien der Saccharomyceten, Mykoderma-Arten und Torulaceen. Bericht über die 43. ordentliche Mitgliederversammlung der Wissenschaftlichen Station für Brauerei in München.* (Old and New Material on Giant Colonies of Saccharomycetes, Mycoderma and Torulae.) H. WILL. *Ztschr. f. d. ges. Brauwesen*, München, 1919, 42, 335.

Giant colonies constitute one of the most important means for the differentiation of the budding fungi. In the group of *Saccharomycetes* in general the various genera show different developmental and growth forms of giant colonies. Within the genera the various species also show variation. Five fundamental types of giant colonies are noted.—R. E. B.

1259. *A new Method for the Preparation of Celloidin Sacs.* C. F. ULRICH. *J. Lab. & Clin. M.*, St. Louis, 1920, 5, 458-459.

A thoroughly clean and dry 20 cc. conical centrifuge tube which is free from scratches and other imperfections in the glass is used. About the base of the conical section strong twine is tied and the tube is plunged in celloidin solution so that the twine is just covered; it is then removed and rapidly rotated until the odor of ether disappears when it is placed in cold water. Carefully loosening the upper end of the sac it is removed by grasping the twine, drawing it down toward the end of the tube and inverting the sac.—F. W. H.

1260. *Labeling Illustrations.* Z. P. METCALF. *Tr. Am. Micr. Soc.*, Menasha, 1920, 39, 149-162.

A description, accompanied by charts, of various methods of lettering and numbering illustrations for various uses.—J. H. B.

## INDUSTRIAL BACTERIOLOGY

1261. *On the Deterioration of Cotton on Wet Storage.* NANCY FLEMING AND AAGE CHRISTIAN THAYSEN. *Bio-Chem. J.*, Lond., 1920, 14, 25-28.

Results are given of a study of the changes caused by bacteria in the structure of the cotton fiber when the cotton is stored in a wet condition. The changes in structure of the fibres could not be studied by direct microscopic examination, but such study was found possible by the use of Cross and Bevan's viscose process. From 0.1 to 0.3 gram of cotton of the sample to be examined were boiled in a 1 per cent solution of sodium hydrate and then washed in running water and dipped in 1 per cent acetic acid and again washed. It was then placed in 1.5 cc. of a 15 per cent solution of sodium hydrate and 1.5 cc. of carbon disulphide added. After treatment in this manner from 15 to 45 minutes it was placed on a slide, covered with a slip, and a drop of tap water allowed to diffuse under the cover slip. Photomicrographs are given of normal fibres and of fibres which have been attacked by microorganisms. The characteristic beading or separation of the fibre into daily growth rings is to be seen in normal fibres, but not in the fibres which have undergone the change.—R. E. B.

## FERMENTATION INDUSTRIES

1862. *Bacteriology, its Practical Application and its Importance outside Medicine.* A. C. THAYSEN. J. Inst. Brewing, Lond., 1920, 17, N. s., 147-155.

A semi-popular article reviewing the importance of microorganisms in brewing, manufacture of butyric and acetic acids, butyl alcohol, acetone, etc.—R. E. B.

1863. *A Central Research, Training and Advisory Institution for the Fermentation Industries.* FRED M. MAYNARD. J. Inst. Brewing, Lond., 1920, N. s. 17, 134-146.

A paper given before the meeting of the Yorkshire and North Eastern Section of the British Institute of Brewing in 1914. A plea for the establishment in Britain of an institute or research station of the type of Versuchs und Lehranstalt für Brauerei in Germany.—R. E. B.

1864. *Fermentation Characteristics of Certain Pentose-Destroying Bacteria.* E. B. FRED, W. H. PETERSON AND AUDREY DAVENPORT. J. Biol. Chem., Balt., 1920, 42, 175-189.

The authors detail studies made with *Lactobacillus pentosaceticus* in yeast water. The fermentation was studied by means of changes in reaction and gas production in fermentation tubes. Xylose, glucose, galactose, fructose, sucrose and lactose allowed growth to a pH value of 3.6 to 4.0. Mannitol decomposed more slowly and gave a limit of pH 4.3. "The results of acidity measurements fail to give any idea of the amount of carbohydrate consumed. The fermentation tube method was tried and found valueless. Apparently the pentose fermenters break down the carbon compound with the production of gas, largely CO<sub>2</sub>, which does not accumulate in the closed end of the fermentation tube. In the case of glucose and galactose as much as 27 per cent of this sugar was converted into CO<sub>2</sub> without any accumulation of gas."

Arabinose and xylose in 2 per cent solutions formed about 20 per cent of normal acid, almost equally divided between acetic and lactic. These sugars were completely destroyed within two weeks. Rhamnose was not attacked.

"The aldo-hexoses, glucose and galactose, are decomposed in a similar manner, yielding acetic acid, lactic acid, and ethyl alcohol. However, the total amount of acid produced is small as compared with that from the pentose sugars; approximately 10 to 14 per cent of normal acid is formed. The non-volatile acid is produced in much larger amounts than the volatile; the ratio is about five parts of non-volatile acid to one part of volatile acid. Glucose is perhaps more easily fermented than galactose." About one-half of the sugar is decomposed in 2 per cent solution in 15 days.

Mannose is fermented slowly, yielding approximately equal quantities of volatile and non-volatile acids. "The ketone sugar, fructose, is rapidly reduced by the pentose bacteria forming mannitol; and at the same time volatile and non-volatile acids and CO<sub>2</sub> are formed. The decomposition of the fructose is very rapid. Within 4 to 6 days after inoculation this sugar has completely disappeared. The disaccharides, sucrose, maltose, and lactose, are all fermented, but never completely." Non-volatile acid is produced in excess. Raffinose and melezitose are not attacked.

"The polyhydric alcohol, mannitol, is slowly broken down by the pentose fermenters forming almost equal amounts of the two acids, acetic and lactic." Glycerol and salicin are slowly fermented. Esculin is not fermented. Starch, inulin and cellulose are not attacked. Xylan is decomposed slowly.

The organic acids, pyruvic, lactic, and malic are fermented, but not succinic, tartaric, nor citric. Acetic acid is produced from lactic acid, and carbon dioxide, acetic acid, and lactic acid from malic acid.—R. E. B.

1865. *Yeast as it Occurs in Nature.* ALFRED JÖRGENSEN. J. Inst. Brewing, Lond., 1919, 15, N. s., 353-355.

The author notes that in cultivated yeasts in some beers there is a tendency for the cells to separate immediately as they are formed instead of remaining in clusters or masses. This makes the product turbid. It is suggested that yeasts growing in nature do not have this tendency and by right cultural methods it is possible to cause microorganisms to regain this wild characteristic, that is, by a process of regeneration. Such regenerated cultures preserve the acquired property so constantly that it has been found to remain unimpaired after more than a year's growth in the laboratory.—R. E. B.

1866. *The Sustenance of Yeast, with Reference to the Influence of Acids and the Brewing of Low-Gravity Beers.* C. G. MATTHEWS. J. Inst. Brewing, Lond., 1920, 17, N. s., 239-254.

A discussion of the effect of acids, particularly of lactic acid in the preparation of low gravity beers.—R. E. B.

1867. *I micodermi del vino. (Mycoderma of Wine.)* GINO DE ROSSI. Staz. Sperim. Agrar. Italiane, 1917, 50, 529-562.

A most interesting study of the differentiations within the genus *Mycoderma* species *vini* (*Desmazières*). The description of this species has heretofore been unfortunately indefinite and the present author has studied the peculiar variations in various cultures which by the

ordinary means of classification are called *M. vini* (*Desm.*). The results have led to a division of the species in four distinct species—*M. vini*, *M. tenax*, *M. duplex*, *M. acidificans*. Differentiation is based upon the following points:

	<i>M. vini</i>	<i>M. duplex</i>	<i>M. tenax</i>	<i>M. acidificans</i>
Liquefaction of gelatin.....	None	None	None	None
Alcohol supported in normal growth.....	12-12.5%	9-10%	4-5%	9-10%
Fermentation of sugar.....	None	None	None	None
Alcohol consumed.....	Considerable	Slight	Slight	Considerable
Acidity of medium.....	Lessened	Slightly lessened	Lessened	Increased
Temperature relations:				
Minimum.....	2- 5°C.	5- 7°C.	12°C.	2- 5°C.
Optimum.....	32-35°C.	32-35°C.	30-32°C.	22-27°C.
Maximum.....	39°C.	39-40°C.	32-35°C.	32°C.
Tartaric acid supported.....	2%	2-4%	2-4%	1-2%

Morphology varies with the age of the culture but the form for each species is constant if observations are made at a definite stage of growth (this may not be on equal dates). The differences in morphological characters are very evident if observations are made between the fourth and eighth days in must or wine of low alcohol content.—A. B.

1268. *Verlust des Oxalsäure-Bildungsvermögens bei einem degenerierten Aspergillus niger.* (Loss of Power of Producing Oxalic Acid in a Degenerated *Aspergillus niger*.) C. WEHMER. Centralbl. f. Bakteriöl. (etc.), Jena, 2. Abt., 1919, 49, 145-148.

A degenerate form of *Aspergillus niger* was secured from Schramm, which had lost the power to produce conidiophores and showed marked development of budding cells. Comparative tests with other aspergilli and with normal strains showed complete loss of power of forming calcium oxalate. Ethyl alcohol was proved to be absent, but a small quantity of normal propyl alcohol was formed.—R. E. B.

1269. *Biologische Beobachtungen an Untersuchungsgegenständen aus der Praxis. Bericht über die 43. ordentliche Mitgliederversammlung der Wissenschaftlichen Station für Brauerei in München.* (Biological Observations on Investigational Matters in Practice.) R. HEUSS. Zeitschr. f. d. ges. Brauwesen, München, 1919, 42, 329.

A discussion of the various biological factors having to do with diseases of beer, particularly the war beers of Germany.—R. E. B.

1270. *Über einige Versuche zur Temperaturanpassung von Hefezellen. Vorläufige Mitteilung.* (A Test of Temperature Adaptation in Yeast Cells. Preliminary Contribution.) HANS EULER AND OLOF SVANBERG. Fermentforsch., Leipz., 1919, 3, 75-80.

A study was made of *Saccharomyces thermantionum* which had been cultivated in a laboratory for 15 years on beerwort at room temperature. It was found that during this time the optimum temperature of this organism had decreased from 44° to about 38°. An attempt to induce Froberg bottom yeasts to show differences when subcultured from cultures grown at different temperatures for from 10-40 days led to entirely negative results.—R. E. B.

1271. *Anwendungen der Abfangmethode auf die Bakteriengärungen. I. Acetaldehyd als Zwischenstufe bei der Vergärung von Zucker, Mannit und Glycerin durch bacterium coli, durch Erreger der Ruhr und des Gasbrandes.* (Utilization of the Fixation Method in Bacterial Fermentation. I. Acetaldehyde as an Intermediate Product in the Fermentation of Sugar, Mannite and Glycerin by *Bacterium coli*, by the Dysentery Bacillus and by the Bacillus of Gaseous Edema.) C. NEUBERG AND F. F. NORD. Biochem. Ztschr., Berl., 1919, 96, 133-157.

The methods used by Neuberg and his co-workers in the study of the products of yeast fermentation are transferred to a study of bacterial fermentation. The essential procedure consists of the utilization of some binding material which will fix the acetaldehyde as rapidly as it is formed. The most suitable materials apparently are the sulphites. This complex is not readily attacked by the ordinary biological agencies. The immediate precursor of the acetaldehyde must be pyruvic acid ( $\text{CH}_3\text{CO}\cdot\text{COOH}$ ). Yeast attacks this, in the presence of sulphites, by means of the enzyme carboxylase splitting it into carbon dioxide and acetaldehyde, according to the reaction  $\text{CH}_3\text{CO}\cdot\text{COOH} = \text{CH}_3\text{CHO} + \text{CO}_2$ . The acetaldehyde combines with the sodium sulphite in accordance with the following reaction:  $\text{CH}_3\text{CHO} + \text{Na}_2\text{SO}_3 + \text{H}_2\text{O} = \text{CH}_3\text{CHOH}\cdot\text{SO}_2\text{Na} + \text{NaOH}$ . The acetaldehyde thus fixed is not readily decomposed by microorganisms. A review of the literature shows that little attention has been paid to the development of acetaldehyde by bacteria. Tests with various bacteria grown in the presence of sulphites showed them capable of producing appreciable amounts of acetaldehyde. That this was not formed as a result of oxidation of ethyl alcohol



formed, was shown by the fact that this occurred as well under anaerobic as under aerobic conditions. Various authors have shown that microorganisms may produce pyroracemic acid. Study showed that acetaldehyde was formed by the action of *Bacillus coli* upon glucose and glycerin in the presence of peptone as well as in pure mineral nutrient solution, sulphites of course being present in each case. Dysentery bacilli of the Flexner-Y and Shiga-Kruse strains all produced acetaldehyde from glycerin, mannite and maltose. *Bacillus* of gaseous edema (Fränkel's bacillus) also produced acetaldehyde from glucose.—R. E. B.

1272. *Anwendungen der Abfangmethode auf die Bakteriengärungen. II. Festlegung der Aldehydstufe bei der Essiggärung. (Utilization of the Fixation Method for Bacterial Fermentations. II. Accumulation of Aldehyde in Acetic Acid Fermentation.)* C. NEUBERG AND F. F. NORD. *Biochem. Ztschr.*, Berl., 1919, **96**, 158-174.

The ability of two organisms, *Bacterium ascendens*, a wine acetic organism, and *Bacterium pasteurianum*, belonging to the beer acetic bacteria group, to produce acetaldehyde in considerable amounts, was discovered. The reaction has been discussed in connection with the review of the preceding article. The authors conclude that transformation of alcohol into acetic acid has as an intermediate step the formation of acetaldehyde.—R. E. B.

1273. *Über den Verlauf der alkoholischen Gärung bei alkalischer Reaktion. II. Gärung mit lebender Hefe in alkalischen Lösungen. (The Course of the Alcoholic Fermentation in Alkaline Reaction. II. Fermentation of Living Yeasts in Alkaline Solutions.)* CARL NEUBERG AND JULIUS HIRSCH. *Biochem. Ztschr.*, Berl., 1919, **96**, 175-202.

In all cases apparently aldehyde is first formed. If sulphites are present, the acetaldehyde unites with the sulphite rendering impossible its subsequent hydrogenation. The hydrogen which in ordinary alcoholic fermentation is used for alcohol formation from the acetaldehyde, now attacks the other half of the sugar molecule, reducing it to glycerin.

When sodium bicarbonate is present, there is no fixation of the acetaldehyde. The glycerin and acetaldehyde are produced in equimolecular proportion, but two molecules of acetaldehyde are transformed into a molecule of acetic acid and one of alcohol. At the beginning of the alcoholic fermentation the acetaldehyde is present in considerable quantities. Toward the close of the fermentation its products of fermentation only are found. Glycerin and acetic acid are, in this case, the corresponding end-products of fermentation.—R. E. B.

1274. *Wirkungsweise der Abfangmethode bei der Acetaldehyd-Glycerin-Spaltung des Zuckers. Die Korrelation von Acetaldehyd und Glycerin innerhalb der gesamten Gärführung, der zeitliche Verlauf dieser Vergärungsform und ihre gewöhnlichen Beziehungen zur alkoholischen Gärung. (The Method of Action of the Fixation Method in the Acetaldehyde Glycerin Splitting of Sugars. The Correlation of Acetaldehyde and Glycerin to the Total Amount of Fermentation, the Time Course of These Types of Fermentation and Their Usual Relationship to Alcoholic Fermentation.)* CARL NEUBERG AND JULIUS HIRSCH. *Biochem. Ztschr.*, Berl., 1919, **96**, 141-158.

After a review of the literature the authors conclude that there have been described three distinct forms of splitting of sugar by yeasts. The first is the ordinary alcoholic fermentation, which occurs in the usual weakly acid reaction of the medium, into alcohol and carbon dioxide according to the old Gay-Lussac expression



The second type is the acetaldehyde-glycerin fermentation of sugar, the result of a so-called fixation process which occurs in the presence of sulphurous acid salts. There is fixed the oxidation product, acetaldehyde, and equivalent amounts of glycerin are formed at the same time in accordance with the following equation:



The third type of reaction in which sugar is split into acetic acid and ethyl alcohol on the one hand, and into glycerin on the other, takes place in the presence of certain salts. It resembles the preceding except that the acetaldehyde apparently is transformed into ethyl alcohol and acetic acid. The complete reaction may be written



Various methods of determining acetaldehyde, glycerin and alcohol in mixtures are discussed and the procedure adopted, outlined. The question, "Are acetaldehyde and glycerin produced at each instant during the fermentative process in equivalent amounts?" was answered in the affirmative. Studies are reported on the rapidity of the development of each of the fermentative product.—R. E. B.

1275. *Hefeernährung und Gärung. Gibt es eine Hefeentwicklung ohne Zuckervergärung? (Yeast Nutrition and Fermentation. Is there any Development of Yeast without Sugar Fermentation?)* TH. BOKORNY. *Centralbl. f. Bakteriöl. (etc.)*, Jena, 2. Abt., 1920, **50**, 23-33.

Yeast development may take place in the absence of fermentable sugars. The results with glycerin and with tartaric acid are particularly interesting, since yeast proteins can be obtained from these cheap carbohydrates. A good nitrogen source stimulates the growth of yeast as well as the formation of zymase—the more nitrogen assimilated, the greater the fermentation. Alcoholic fermentation is not an unconditional necessity for yeasts, particularly under aerobic conditions, but is used in the presence of fermentable sugars, as a means, in the struggle for existence, to eliminate the growth of other microbes.—S. A. W.

1276. *Weitere Studien über den Einfluss von aus Hefe gewonnenen Stoffen auf die Vergärung von Kohlehydraten durch Hefe.* (Further Studies on the Influence of Substances Secured from Yeasts on the Fermentation of Carbohydrates by Yeasts.) EMIL ABDERHALDEN. *Fermentforsch.*, Leipz., 1919, 3, 44-69.

Abderhalden and Schaumann previously reported that the alcoholic extract of air dried yeasts when added to an aqueous solution of carbohydrates considerably increased the rapidity of fermentation of these carbohydrates by yeast. It was further noted that the action of the carboxylase on potassium pyruvic acid was considerably increased. The paper reviewed is an elaboration of that theme. In the studies 10 grams of the carbohydrate tested were dissolved in 250 cc. of water and 1 gram of pure yeast added. When the evolution of carbon dioxide materially decreased, additional sugar was added. The study was continued until the addition of sugar no longer resulted in increased evolution of carbon dioxide. It was demonstrated that the addition of yeast extract materially increased the total amount of sugar that could be fermented in a single test of this kind.

It was found that the yeast extract accelerated fermentation much more even than fructose by phosphoric acid. There seems to be a direct stimulating effect upon the rapidity of the development of the yeast.—R. E. B.

## MYCOLOGY

(See also Numbers 1241, 1319)

1277. *Fossil Micro-organisms from the Jurassic and Cretaceous Rocks of Great Britain.* DAVID ELLIS. *Proc. Roy. Soc. Edinb.*, 1915, 35, 110-112, 113-132.

While examining a series of slides from various rocks of the Jurassic and Cretaceous periods, gathered together in connection with borings for ironstone, the author devoted special attention to microorganisms that might be associated with iron deposits. The fungus which he found and described as *Phycomyces frodinghamii* was found in the Frodingham ironstone of Lincolnshire. The parts of the fungus identified include hyphae, sporangia, and spores. Another fungus, found in the ironstone of Raasay (North-west Scotland), and consisting of branching hyphae only, has been designated as *Palaeomycesia*. He also records an *Actinomyces*, and several bacteria from the same or similar rocks. The organism called *Phycomyces frodinghamii* seems to have had a chemiotactic affinity for iron-compounds, and may have enriched the deposits where it was found. All these fossil fungi were found in the cells of plant tissues that were in a rotting condition when fossilizing processes took place. (A. L. S. in *J. Roy. Mic. Soc.*, Lond., 1919, 249, 331.)—E. B. F.

1278. *Les levures des saucissons.* (Yeasts Isolated from Sausage.) E. CESARI AND A. GUILLERMOND. *Ann. de l'Inst. Pasteur, Par.*, 1920, 34, 229-248.

The strains of yeast isolated from sausages and salt meats were studied on various media and their methods of reproduction determined. These yeasts were found to be most similar to *Torula*. They sporulate usually after "heterogamic copulation." Parthenogenesis was only rarely observed. The organisms are classed in the genus *Debaryomyces* (Klocker).—S. B.-J.

1279. *Production d'acide formique par la levure dans les milieux amides.* (Production of Formic Acid by Yeast in Media Containing Amides.) P. THOMAS. *Ann. de l'Inst. Pasteur, Par.*, 1920, 34, 162-176.

When yeast is grown in a medium containing glucose and a nitrogenous compound such as urea or acetamide, formic acid is produced. Quantitative studies show that the source of the formic acid is not the urea, but the glucose. Qualitative variations of the source of nitrogen in the medium also substantiate this. Presumably the production of formic acid from glucose by yeast occurs through the following changes: glucose to methyl glyoxal and a molecule of glyceric aldehyde, methylglyoxal to lactic acid, and from this the formation of alcohol and carbonic anhydride.

Some facts are at variance with this hypothesis, and the author concludes the metabolic products of yeast vary with the media and conditions under which the organism is grown.—S. B.-J.

1280. *Altes und Neues über die Riesenkolonien der Saccharomyceten, Mycoderma-Arten und Torulaceen.* (Old and New Investigations on the Giant Colonies of Saccharomycetes, Mycoderma-species and Torulaceae.) H. WILL. *Centralbl. f. Bakteriol. (etc.)*, Jena, 2. Abt., 1920, 50, 1-23; 294-310; 317-335, 410-415.

A detailed study of the formation and growth of giant colonies of various *Saccharomycetes*, *Mycodermae* and *Torulaceae*.—S. A. W.

1281. *Über den Einfluss der Konzentration der Würze auf die Biologie der Hefe.* (On the Influence of the Concentration of Wort on the Biology of Yeasts.) HEINRICH ZIKES. *Centralbl. f. Bakteriol. (etc.)*, Jena, 2. Abt., 1919, 49, 174-181.

Yeast cells multiplied somewhat more rapidly in 1° than in 11° and 9° and similar high percentage worts. In 5° wort and wort of lower degree they multiply about equally rapidly.

The author has made a study of the effect of concentration of wort upon a Froberg type of yeast. Studies were made of the length of generation time and rapidity of fermentation, also of the form and shape of the yeast cells, vacuole formation and granule production, glycogen formation and staining reaction towards methylene blue.—R. E. B.

1282. *Studien über die Schimmelpilze des Brotes. (Studies on the Molds of Bread.)* W. HERTER AND A. FORNET. Centralbl. f. Bakteriologie. (etc.), Jena, 2. Abt., 1919, 43, 148-172.

Some 13 species of fungi were selected from moldy bread as follows: *Aspergillus glaucus* Link, *Rhizopus nigricans* Ehrenberg, *Penicillium crustaceum* (L.) Fries, *Oospora variabilis* (Lindn.) Lindau, *Penicillium olivaceum* Wehm., *Aspergillus fumigatus* (Fresen.) de Bary, *A. niger* van Tiegh., *A. flavus* Link, *A. nidulans* (Eidam) Winter, *A. candidus* (Pers.) Link, *Mucor pusillus* Lindt, *Oospora lactis* (Fresen.) Lindau, *Mycoderma cerevisiae* Aut. The conidia of the molds are found in the flour and thus get into the bakery. They are there present in dust and may infect the bread at any time. It is possible to keep bread free from molds by wrapping in paper. Moisture and temperature are the principal physical factors; sugar content, acid content and oxygen content the most important factors determining the growth. Under dry conditions the bread remains mold free indefinitely. With the slightest degree of dampness *Aspergillus glaucus* appears. At low temperatures *Aspergillus glaucus*, *Rhizopus nigricans*, and *Penicillium crustaceum* develop well. The other fungi prefer higher temperatures. *Oospora variabilis* is relatively tolerant to sugar, and *Aspergillus glaucus* to acid. *Rhizopus nigricans* and *Mucor pusillus* grow most quickly. *Penicillium crustaceum* grows more slowly. Development of mold is inhibited little, if at all, by salicylic acid and by the kind and degree of fineness of the flour. Descriptions with figures are given for the most common species of molds found in bread.—R. E. B.

1283. *Unterscheidung einiger Penicillium-Spezies nach physiologischen Merkmalen. (Differentiation of some Penicillium Species by Their Physiological Characteristics.)* WILHELM WÖLFFE. Centralbl. f. Bakteriologie. (etc.), Jena, 2. Abt., 1918, 43, 97-130.

Eighteen species secured from Wehmer were studied. Ten of the species were unnamed, the others were labeled *Pen. glaucum*, *corymbiferum*, *viridicatum*, *roquesforti*, *italicum*, *olivaceum*, *purpurogenum* and *luteum*. The species were studied on wort agar and wort gelatin, on fluid media with various sources of nitrogen including potassium nitrate, ammonium nitrate, ammonium sulphate and asparagin. The acidity or alkalinity of the culture was also noted. The effect of sodium chloride, acetic acid and lactic acid in addition to the resistance of the various species to different concentrations was studied on different media. The ability of the various species to peptonize casein and produce acid in milk was studied, likewise resistance to temperatures and the ability to ferment cellulose. Inoculations were also made on various fruits, such as apples and pears. A key to the various species based upon physiological characters is included. Convenient tabular comparisons of the species are made on the basis of their various physiological characters.—R. E. B.

1284. *Die Angreifbarkeit von cis-transisomeren ungesättigten Säuren durch Pilze. (The Utilization of Cis-transisomeric Unsaturated Acids by Fungi.)* P. E. VERKADE AND N. L. SÖHNGEN. Centralbl. f. Bakteriologie. (etc.), Jena, 2. Abt., 1920, 50, 81-87.

The assimilation or lack of assimilation of a number of cis-transisomeric unsaturated acids, in a synthetic solution, by *Aspergillus niger* and *Penicillium glaucum* seems to depend primarily on the chemical constitution of the substances; this holds true both of the free acids, and their calcium salts. On comparing the solubility of these acids in water and olive oil, it is suggested that most of the theories explaining the structure of the plasma membrane do not account for the assimilation or non-assimilation of the acids by fungi; the data obtained on the utilization of the above acids by fungi are contradictory only when the plasma membrane is considered as a lyophile colloid, consisting of lipoids which have absorbed a considerable amount of water.—S. A. W.

1285. *Zur Physiologie von Torula rubefaciens G. (On the Physiology of Torula rubefaciens G.)* GROSZUSCH. Centralbl. f. Bakteriologie. (etc.), Jena, 2. Abt., 1920, 50, 310-317.

The physiology of a *Torula* previously described, particularly its behavior towards acids and ethyl alcohol, is reported.—S. A. W.

1286. *Über die Pleophagie des Insektenpilzes Metarrhizium anisopliae (Metsch.) Sor. (On the Pleophagy of the Insect Fungus Metarrhizium anisopliae (Metsch.) Sor.)* K. FRIEDERICH. Centralbl. f. Bakteriologie. (etc.), Jena, 2. Abt., 1920, 50, 335-356.

The fungus *Metarrhizium anisopliae* can be readily transferred from one species of insects to another, either directly or after cultivating the organism for one or more generations on artificial culture media. The infected insect must first be weakened by unnatural or unfavorable conditions, or during the maturity of the pupa stage.—S. A. W.

## SOIL BACTERIOLOGY

(See also Numbers 1242, 1245, 1247, 1306)

1287. *Bacterial Flora of New Soils*. C. B. LIPMAN AND D. D. WAYNICK. Cal. Agr. Exper. Sta., Ann. Rpt., 1918-19, 62.

Examinations made of calcareous sands from one of the islands off the coast of Florida have shown that this soil, which is practically devoid of organic matter, contains one group of nitrogen-fixing bacteria, *Azotobacter*, but that nitrification is practically nil. A number of species of unidentified and probably new *Actinomyces* have been found in this soil. The numbers of bacteria found were surprisingly large considering the nature of the medium.—J. M. S.

1288. *Bacteriological Effects of Green Manure. II*. C. F. BRISCOE AND H. H. HARNED. Miss. Agr. Exper. Sta., Bull. 185, 1918.

This is a progress report on experiments begun in 1913, to determine the effect of micro-organisms in the fermenting of green manures and particularly the advantage of a light dressing of stable manure as compared with that of a bacterial culture in the utilization of these green manures for plant food. The work included bacteriological and vegetative tests. The soil used was deficient in plant nutrients. The green manures added were alfalfa, oats, and cowpeas.

It was found that there was a direct relation between the bacterial count and the amount of organic matter added. The results of the vegetative tests and the bacteriological tests agreed closely. A light dressing of stable manure or the addition of a bacterial culture with a green manure gave a marked increase in the crop when 4 tons of the green manure were added. When 8 tons were added the effect was practically neutral, and when 16 tons were added a depressing effect was noted from the addition of the organisms contained either in the manure or in the bacterial culture. This phase of the work is to receive further attention.

The nitrogen content of the oat crop varied with the amount of crop produced, but not in direct proportion. The accumulative effect of green manure was marked, showing a uniform increase through the various treatments and continued effect in the following years. Where dry oats and vetch straw were turned under it was found that amounts as large as 16 tons were readily utilized and produced a crop 3.2 times that from untreated soil. Eight tons of the straw produced a larger crop than 20 tons of horse manure. The proportions were about one part oats and two parts vetch straw, and the horse manure was applied with and without lime. It was also noted that where large amounts of the oats straw were used together with horse manure or with a bacterial culture, or both, a depressing effect was brought about. (Expt. Sta. Rec.)—J. M. S.

1289. *Bacteria as Decomposers of Soil Minerals*. WRIGHT. Cal. Agr. Exper. Sta., Ann. Rpt., 1918-19, 62.

Evidence has been obtained that bacteria are capable of dissolving considerable quantities of minerals in soil through the production of acid, chiefly carbonic acid. It is further concluded, "that the general laws of chemical equilibrium applying for a system of any acid with a mass of mineral, hold for a system of mineral plus a nutrient solution containing bacteria."—J. M. S.

1290. *A Suggestion as to the Flagellation of the Organisms Causing Legume Nodules*. H. J. CONN AND R. S. BREED. Science, N. s., 1920, 51, 391-392.

The authors note a possible explanation of the variations found in the results of various observers concerning the number of flagella to be found upon the bacteria forming nodules upon leguminous plants. It is suggested that the cow pea and soy bean organisms may be monotrichic in young cultures and peritrichic when older.—R. E. B.

1291. *Symbiotic Nitrogen Fixation as Influenced by the Nitrogen in the Soil*. W. A. ALBRECHT. Soil Sc., Balt., 1920, 9, 275-328.

Working with a yellow silt loam from Illinois it was found that nitrogen-fixation will take place in a soil containing large amounts of nitrogen either as nitrates or organic matter. No injurious effects on N-fixation were caused by nitrates and it is pointed out that larger amounts than are ever used in agricultural practice are necessary to cause injury. Nodules were produced when large amounts of organic N were present in the soil and good legume growth resulted even when sufficient organic matter was present to give large losses of volatile N from the soil. The addition of some organic matter increases the amount of N fixed by cowpeas. In soils containing varying amounts of total N as much fixation of N by cowpeas may be expected with 3000 pounds of total N as in one with lesser amounts. According to the data given, variations in the amount of total N in a soil failed to exert any varying influence on the amount of N fixed.—N. K.

1292. *The Potential Biochemical Activity of the Spores of Soil Bacteria.* J. R. NELLER. Soil Sc., Balt., 1920, 9, 329-340.

Infusions from the 5 successive layers of the upper 64 cm. of soil were heated to 85°C. for 10 minutes and the carbon dioxide production, ammonia accumulation, and numbers of bacteria were compared with a similar treatment with unheated infusions. Less than 9 per cent of the original count survived in the surface and considerably less in the subsoil when heated to 85°C. for 10 minutes. In 7 days the ammonia accumulation resulting from inoculation with heated infusions was between 40 and 50 per cent, while the carbon dioxide production in 7 and 10 days was about 75 per cent. From these data it is concluded that the accumulation of ammonia and the production of carbon dioxide resulting from inoculating a sterile soil with heated infusions correlate with each other in showing that the bacterial spores of the soil are capable of energetic activity when supplied with sufficient food and moisture. The limitations of these data as applied to the conditions under which there is competition with other microorganisms are indicated.—N. K.

1293. *Über Denitrifikation bei Gegenwart von schwer zersetzlichen organischen Substanzen.* (Denitrification in the Presence of Organic Substances Decomposed with Difficulty.) OTTO NOLTE. Centralbl. f. Bakteriologie (etc.), Jena, 2. Abt., 1919, 49, 182-184.

The author states that in previous investigations it is assumed that two conditions are necessary for denitrification; the absence of oxygen and the presence of physical organic substances. Usually those employed have been such as could be easily transformed, e.g., glycerine, many kinds of sugar, starch, citric acid and similar acids. Straw, on the other hand, apparently is utilized by denitrifying bacteria with some difficulty. The more the plant cell has been lignified the more difficult is it for the denitrifying bacteria to make use of it. The author has made a study of the effect of extracted cinchona bark on the process of denitrification and concludes that it can serve as an energy source for microorganisms bringing about denitrification, and that denitrification increases proportionately as oxygen decreases.—R. E. B.

1294. *Über Nitratreduktion in nassem Ackerboden ohne Zusatz von Energiematerial.* (Nitrate Reduction in Untreated Soil without the Addition of Energy Material.) ALICE OELSNER. Centralbl. f. Bakteriologie (etc.), Jena, 2. Abt., 1918, 48, 210-221.

Studies were made of the effect of variable amounts of water upon soils containing varying amounts of nitrates. In general, it was found that even without the addition of any source of energy material, such as carbon, there was rapid reduction, sometimes almost complete disappearance of the nitrates present. In 40 to 50 per cent water content of the soil it was found that the nitrate nitrogen had not passed over into the form of protein nitrogen. The nitrate is transformed largely into elementary nitrogen. The energy source for this denitrification is to be found in the carbonaceous organic substances present in the soil. Previous results had in general led to the conclusions that denitrification was of significance only in the presence of considerable quantities of cellulose, straw and similar materials in the soil. The present studies indicate that such are not necessary, the normal soil humus being sufficient.—R. E. B.

1295. *Effect of Manure-Sulphur Composts upon the Availability of Potassium of Greensand.* A. G. MCCALL. J. Agric. Research, Wash., 1920, 19, 239-256.

The greensands and the greensand marl deposits of the eastern United States have long been regarded as a possible source of potassium for agricultural purposes; but their potassium is largely insoluble and hence unavailable. The writer, recalling the recent work as to the increase in availability of phosphorus in sulphur composts, due to the action of the acids produced by bacterial action, planned an investigation to see if the same thing might not take place with the potassium of greensand if composted with sulphur and manure, or soil, or both. Several different compost mixtures were used in the investigation, the best results being obtained when manure and sulphur were mixed with the greensand without soil. Under these conditions the amount of water-soluble potassium was increased to 12 or 20 times the original amount in 23 weeks, the increase depending upon the total potassium originally present in the greensand.

The results indicate, in the author's opinion, that the composting of greensand, or of soil rich in potassium, with sulphur and manure may prove to be a practical and efficient method for obtaining available potassium from comparatively insoluble materials.—H. J. C.

1296. *Nitrification.* W. P. KELLEY. Cal. Agr. Exper. Sta., Ann. Rpt., 1918-19, 59.

It is noted that certain California soils fail to show nitrification in laboratory tests when the amount of organic matter used is excessive (as is the usual practice in laboratory tests), but when the amount of application approaches field practice, nitrification takes place rapidly.

"Virgin soil at Riverside and soil from plots treated with inorganic fertilizers through a period of years, or unfertilized, are unable to effect the nitrification of 1 per cent dried blood, but treatment with manure or cover crops for a number of years has so changed the soil as to permit active nitrification of 1 per cent dried blood. Plots treated with dried blood or bone meal have so affected the soil as to permit the formation of nitrites from 1 per cent dried blood,

but nitrate is still produced only feebly. Previous treatment with potash and phosphate fertilizers registers no effects on nitrification in this soil. The addition of lime and gypsum produces only slight effects. However, all of the common nitrogenous fertilizers undergo active nitrification in these plots when applied in quantities approaching field applications."

Grain straws and straw manure cause a temporary retardation of nitrification. Products of nitrification increase the solubility of calcium in soil; but it is doubted if it affects the solubility of the soil phosphate or rock phosphate.

Applications of the results obtained to tillage practice are suggested.—J. M. S.

1297. *Legume inoculation.* A. F. VASS. Wyoming Agr. Exper. Sta., Circ. 15. 1920.  
A circular of information.—J. M. S.

1298. *Legume Inoculation.* D. B. SWINGLE AND G. B. NUTTING. Montana Agr. Exper. Sta., Circ. 88. 1920.  
A circular of information.—J. M. S.

1299. *Die Kohlensäure-Frage, ist sie neu oder alt? (The Carbon Dioxide Question, Is It New or Old?)* HUGO FISCHER. Centralbl. f. Bakteriöl. (etc.), Jena, 2. Abt., 1918, 48, 515-520.  
The author takes exception to a statement in Löhnis "Boden-Bakterien und Boden-Fruchtbarkeit," Berlin, 1914, in which he states that it is only recently that the function of humus in supplying carbon dioxide for growing plants has been adequately appreciated. The author calls attention to his own work, to the work of Tschaplowitz, Demoussy and others, made from one to three decades ago.—R. E. B.

1300. *Contribuzione alla conoscenza dell'arrabbiaticcio o caldasfretta dei terreni. (A Contribution to the Knowledge of the Condition Known as Fire-Fang of Soils.)* R. PEROTTI. Rendic. r. Accad. Lincei Roma. Classe Fis. Mat. Nat. 1919, 28, 288-292.

Three samples of soil from an estate were studied, which when sown to wheat gave only a meagre grain production sometimes as low as one or two grains in a head. This was accompanied by an underdevelopment of the whole plant and a very luxuriant vegetation of fungal mycelium on the roots of the plants. Investigations were made as to the ability of the soil to perform some of the functions necessary for the nitrogen cycle in nature, and counts of the bacteria and fungous flora of the soil were also undertaken. The results are here appended in tabular form:

	NORMAL SOIL	ABNORMAL SOIL
Ammonifying power of the soil mgm. $\text{NH}_3$ .....	3.446	3.467
Nitrifying power of the soil mgm. $\text{HNO}_3$ .....	0.650	0.700
Denitrifying power, hours required for denitrification.....	95.9	108.0
Nitrogen fixing power, mgm. N.....	0.600	0.690
Number of bacteria in q. cm. of soil.....	1,197,500	1,882,000
Number of hyphomycetes in q. cm. of soil.....	75,625	255,000

From these data the author concludes that the cause of the special condition of the soil and of its low productivity is not a lack of biological means for the transformations of nitrogen, but the overcrowding of the soil by hyphomycetes with the subsequent accumulation of the products of their life activities, products which are known to be injurious to plants with a delicate root system, such as wheat.—A. B.

## PLANT PATHOLOGY

1301. *Production of Tumors in the Absence of Parasites.* E. F. SMITH. Arch. Dermat. & Syph., Chicago, 1920, 2, 176-180.

The writer discusses the production of hyperplasias in plants (1) by application of dilute acids and alkalis; (2) by the crown gall bacterium which probably produces a similar condition within the cells, and (3) by limiting the oxygen supply a hyperplasia may be brought about in the absence of parasites.—R. D. H.

1302. *Basal Glumerot of Wheat.* LUCIA McCULLOCH. J. Agric. Research, Wash., 1920, 18, 543-551.

"A bacterial disease of wheat caused by a hitherto undescribed organism has been found on heads of wheat collected in various and widely separated localities in the United States and Canada.

"The most noticeable external character of the disease is the brown to black discoloration on the lower part of the glumes and of the adjacent rachis. The grains inclosed by the diseased glumes have bacteria in the tissues at the germ end. In advanced cases this end of the grain is black and charred in appearance.

"The discolored tissues swarm with bacteria. These have been isolated not only from freshly collected material but also from grain kept in the laboratory for 17 months.

"The parasite is a white, polar-flagellated rod, producing a green fluorescence in the ordinary culture media."

The writer gives a description of the cultural characteristics of the organism and names it *Bacterium atrofaciens*. The typical features of the disease have been produced by inoculating wheat with cultures of it and the same organism has been reisolated from the artificially infected plants.—H. J. C.

1903. *Halo-Blight of Oats*. CHARLOTTE ELLIOTT. J. Agric. Research, Wash., 1920, 19, 139-172.

Halo-blight, so-called from the halo-like margins of chlorotic tissue surrounding the one to several millimeters of dead tissue, is widely distributed, but becomes severe enough to occasion appreciable losses only under exceptionally favorable weather conditions.

The writer obtained two organisms from these lesions, one producing white colonies on agar, the other yellow. The white organism was found constantly, the other only when the surface of the tissue was not sterilized. Inoculation experiments showed conclusively that the white organism is responsible for the production of typical lesions. The yellow organism is evidently a surface saprophyte.

The organism is carefully described. It is a small rod with a capsule and polar flagella, which the writer names *Bacterium coronafaciens*. She compares it with several other parasites producing similar diseases, showing its points of difference.

Isolation and inoculation experiments are described in detail. The bacteria were found to be confined to the dead central portion of the lesion, the chlorotic area probably being caused by the diffusion of NH<sub>3</sub> formed in the infected tissue. The organisms probably live over winter on seed, and by treating the seed with 1 to 320 formalin the disease can be partially controlled. Apparently by heating seed for 30 minutes at 100°C. the disease can be entirely controlled. The organism is slightly pathogenic on wheat, rye, and barley. Different varieties of oats show differences in susceptibility to the disease.—P. L. G.

1904. *Artificial and Insect Transmission of Sugar-Cane Mosaic*. E. W. BRANDES. J. Agric. Research, Wash., 1920, 19, 131-138.

A report of a series of rather inconclusive experiments on the transmission of sugar cane mosaic by insects and by artificial means. The author says: "It is considered as proved, however, that the cell sap of diseased plants is infectious when introduced in the proper manner and that the disease can be transmitted by insects."—P. L. G.

1905. *Behavior of the Citrus-Canker Organism in the Soil*. H. ATHERTON LEE. J. Agric. Research, Wash., 1920, 19, 189-205.

It is a commonly accepted idea among fruit growers and horticulturists that the citrus-canker organism, *Pseudomonas citri* Hasse, lives and multiplies in the soil; but this conclusion depends merely on field evidence and on the demonstration that *P. citri* can live in sterilized soil. The writer raises the question whether it can live in unsterilized soil in competition with the normal soil flora.

Experimental work was undertaken at Lamo, P. I., to answer three questions: (1) Is *P. citri* able to live actively within the soil? (2) Can it exist passively within the soil? (3) Is it killed within the soil?

To investigate the matter the writer inoculated the organism into both sterilized and unsterilized soil, keeping some lots in culture tubes in the laboratory, others in flat boxes in the orchard. In every case successful inoculations of *Citrus maxima* were made from the unsterilized soil even as late as 14 days after introducing the organism; but successful inoculations were obtained from the unsterilized soil only during the first 3 or 4 days, the results after the ninth day being uniformly negative. Similarly, the soil beneath an infected tree was found to be infectious immediately after a rain, but only for a few days after the source of infection was removed by cutting down the tree. Seeds planted in soil artificially infected were found to develop into healthy seedlings.

These findings have a practical bearing because they indicate that an outbreak in a new citrus orchard cannot be due to the persistence of the organism in the soil. The writer speculates as to the possible explanation of such reinfection, mentioning cankers on roots and buried leaves as possible places for holding over the organism.—H. J. C.

1906. *Decline of Pseudomonas citri in the Soil*. H. R. FULTON. J. Agric. Research, Wash., 1920, 19, 207-223.

This is a report of work conducted in an isolated greenhouse near Washington, D. C. It "was undertaken primarily to determine whether or not the citrus-canker organism, *Pseudomonas citri* Hasse, is capable of persisting in the soil to such an extent as to make the soil an important medium in holding over or disseminating the organism."

The investigations involved a study of the persistence in different types of soil, and the influence of initial inoculum, temperature, soil moisture, reaction, depth in soil and sterilization upon persistence in soil of *P. citri*.

The plating method is not satisfactory to determine the presence of this organism because of the preponderance of more rapidly growing soil organisms. The writer finds a very sensi-

tive method of determining its abundance in soil to be the use of graded dilutions of soil washings for inoculating punctured grapefruit leaves.

The data indicate a rapid decline in all types of soil. "This decline was retarded slightly by rendering the soil alkaline with lime water, or by lowering its temperature, and more decidedly by withholding water or by previous sterilizing with steam.

"The decline is accelerated decidedly by the addition of dilute sulphuric acid or by a moderate rise in temperature."

*P. citri* may exist in small numbers for a long time in air dry soil, but immediately disappears upon the addition of water. It easily penetrates soil, but the depth in the soil has no influence upon its longevity.

"In water the decline is more rapid than in soil. Previous sterilization of the water has a decided effect in prolonging persistence."

Certain bacteria found commonly in soils have a marked deleterious effect on *P. citri* in artificial culture media both by inhibiting growth and by killing. This may explain its rapid decline in unsterilized soil and water.

Seedling roots seem to be infected only through wounds. As a rule the decline in *P. citri* reaches the vanishing point by the test method in about two weeks. "All these considerations suggest that agricultural soils probably can not long retain a dangerous possibility of disseminating the citrus-canker organism."—P. L. G.

1307. *Beiträge zur histologischen und physiologischen Erforschung der bakteriellen Krankheit der Gefäßbündel der Kartoffelnollen.* (Contribution to the Histological and Physiological Investigation of the Bacterial Disease of the Fibrovascular Bundles of the Potato Tuber.) F. STRANÁK. Centralbl. f. Bakteriöl. (etc.), Jena, 2. Abt., 1918, 48, 520-543.

The author makes reports on an anatomical study of the structure of the corky tissue of the potato tuber and its relationship to infection with the disease. Those potatoes showing thicker cork layers are somewhat less susceptible. A comparative study of the water content of infected and non-infected tubers showed in general the infected tubers had a water content 8 to 12 per cent higher. The acidity of infected portions was somewhat lower than that of non-infected. Comparisons were also made of the relative amount and composition of ash.—R. E. B.

## DAIRY BACTERIOLOGY

(See also Number 1232)

1308. *Public Health Studies Concerning Cheese.* E. C. SCHROEDER AND G. W. BRETT. J. Am. Vet. M. Ass., N. Y., 1918, 52, N. s. 5, 674-685.

Of a total of 256 samples of cheese examined for tubercle bacilli, 19 or 7.42 per cent were found to be infected.

One of the infected samples was cottage and all others were cream. No infection was found in Cheddar or Neufchatel. Details of the technic, which consisted of guinea pig inoculations, are given. It is suggested that the failure to find tubercle bacilli in Neufchatel, which, like cream, is used while comparatively fresh, is due to the fact that the Neufchatel examined was usually made from skim milk, while cream is made from whole milk with some cream added. The tubercle bacilli are carried with the cream.—L. A. R.

1309. *Die normale Gasbildung im Edamer und Gouda Käse.* (Normal Gas Formation in Edam and Gouda Cheese.) F. W. J. BOEKHOUT AND J. J. OTTO DE VRIES. Centralbl. f. Bakteriöl. (etc.), Jena, 2. Abt., 1918, 48, 130-139.

Usually gas development is evident in Edam and Gouda cheese 10 to 12 days after its preparation, forming spherical or slit-like openings in the mass. The first is normal, the latter abnormal and undesirable. The gas pockets form after all the lactose has disappeared; microorganisms must therefore utilize calcium lactate, or nitrogenous compounds.

Organisms having the morphology of a short rod, almost a diplococcus, were isolated on media containing calcium lactate. Colonies on peptone-calcium lactate gelatin after 8 days at 21°C. are pin-point in size, growing better in the depths of the gelatin, that is under anaerobic conditions. Growth is somewhat more rapid in whey gelatin. Milk is not well suited as a medium; almost no visible change occurring in 3 to 6 weeks at 21°C. Peptone is necessary as a source of nitrogen; asparagin, ammonium and potassium nitrate proved unavailable. The gas developed in the presence of calcium lactate is composed of CO<sub>2</sub>, H<sub>2</sub>, and traces of nitrogen.—R. E. B.

1310. *Source and Significance of Streptococci in Market Milk.* F. S. JONES. J. Exper. M., N. Y., 1920, 31, 347-361.

A study has been made of streptococci isolated from skin, mucous membranes and feces of cows from a certified milk herd and the bottled milk from the same dairy, with particular reference to the determination of the source of the streptococci found in the bottled milk.

All the streptococci from the vagina, saliva, skin and feces were non-hemolytic. Those from the saliva formed a heterogenous group, strains which fermented raffinose, inulin and mannitol predominating. Streptococci from the skin were characterized by fermentation of



dextrose, lactose, saccharose, maltose, raffinose, mannit and salicin, but not inulin; whereas those from the feces were similar except that they fermented inulin and failed to ferment mannit. These organisms were rarely isolated from the bottled milk.

The principal source of streptococci from the milk was the cow's udder, the majority of organisms agreeing in cultural characteristics and agglutination with mastitis streptococci. Of 72 strains isolated, 56 were hemolytic, 16 non-hemolytic. Fifteen of the non-hemolytic produced considerable acid in dextrose, lactose, saccharose, maltose and salicin, and all but one were agglutinated by mastitis streptococcus serum in a dilution of 1 to 500, thus falling into the mastitis group. The other non-hemolytic strain was of the fecal type. Of the 56 hemolytic strains, 43 agreed in cultural characteristics and agglutination reactions with the hemolytic types most frequently associated with mastitis, producing considerable acid in dextrose, lactose, saccharose and maltose, sometimes in salicin, and agglutinated in high dilutions by the mastitis streptococcus serum.

The remaining 13 hemolytic strains produced smaller amounts of acid with dextrose, lactose, saccharose and maltose, but none with raffinose, inulin, mannit or salicin. The limiting hydrogen ion concentration in dextrose bouillon fell within the limits for human streptococci as determined by Avery and Cullen. They were non-pathogenic for mice. Samples from the udders of a large number of cattle revealed these low acid producing types in but 2 out of 50, and then in very small numbers as compared with other hemolytic streptococci. It is possible they may have been of human origin.—W. P. B.

**1311. Microscopic Count of Bacteria: Its Value in Sanitary Control of Milk Supply.** PERCY WERNER, JR. Hoard's Dairyman, Ft. Atkinson, 1920, 59, 1194.

In making direct counts by the Breed method the sample may be preserved with formalin in the proportion of 1:5000 and the count made when convenient without affecting the accuracy of the results. The value of this method for towns too small to maintain their own laboratory is pointed out.—L. A. R.

**1312. Number of Bacteria on the Lips of Milk Bottles and Their Significance.** ROY S. DEARSTYNE. Am. J. Pub. Health, Concord, 1920, 10, 533-535.

The present method of delivering and handling milk in bottles is far from satisfactory as street dust, dirty hands, animals and careless filling of bottles all contribute their quota of bacteria, some of which may be pathogenic. The bacteria deposited upon the top and cap of a milk bottle may be more dangerous than those found within the bottle.—M. C. P.

**1313. Die Frage der Milchpasteurisierung in moderner Beleuchtung. (The Question of the Pasteurization of Milk in Modern Light.)** ORLA JENSEN. Milchw.-Zentbl., Hanover, 1920, 49, 45-53.

A critical review of the literature on the pasteurization of milk is given with a comparison of the low temperature discontinuous method with high temperature continuous method as practiced in Denmark. The conclusion is drawn that for the pasteurization of milk for domestic use the low temperature method gives the most satisfactory results. The writer believes that for cheese making it will be necessary to use the low temperature method, but for preparing cream for butter making better results are secured by heating the milk or cream to 80° or more. One experiment is cited in which milk was heated at temperatures varying from 60 to 95°C. for 30 minutes, inoculated with lactic acid bacteria, and held at different temperatures. In the milk heated to 75° or less the germicidal property was not destroyed and bacteria of the hay bacillus type developed, often overcoming the lactic bacteria. In milk heated to 80° or higher the germicidal property was destroyed and the lactic bacteria were able to make a good growth.—L. A. R.

**1314. Importance of Sterilization in the Successful Operation of Milking Machines.** GEORGE H. HART. Pacific Dairy Rev., San Fran., 1919, 23, 12-15.

Many milking machines are discarded because of more frequent cases of inflammation of the udder and of lower bacteriological quality of the milk. The disinfecting solutions usually employed depend on free chlorine for their sterilizing action and as ordinarily employed are ineffective. The free chlorine of such solutions is shown to be quickly exhausted when rubber or small quantities of milk are present. In the latter case it may become a medium in which bacteria multiply. This condition exists in practice when the rubber parts of the machine are not properly washed before immersing in the disinfecting solution. When the rubber becomes checked the milk penetrates the fine cracks where it is not reached by the solution and becomes a focus of infection.

On one large farm supplying certified milk to San Francisco the machines were kept in a satisfactory condition by first rinsing in cold water and then washing in alkali, using a brush on all parts through which the milk passes. After washing, the parts are submerged in water which is heated to 190°F. and held at this temperature for 15 to 30 minutes. The rubber parts are less affected by this treatment than is commonly supposed, but some of them must be replaced about once in 2 to 4 months. Under these conditions no trouble was experienced in keeping the bacterial count of the milk below 10,000 per cc., and with the danger of infection from improperly cleaned teat cups removed there was no trouble from inflammation of the udder.—L. A. R.

1315. *The Churn as a Factor in the Contamination of Butter.* H. W. GREGORY. N. York Produce Rev. & Am. Creamery, N. Y., 1920, 50, 18-22.

A comparison was made of the efficiency of different methods of washing the churn. After the butter was removed from the churn, it was washed by one of the methods, tested, allowed to stand open until the following morning, and tested for bacterial contamination by churning a definite volume of water of known low count. A bacterial count of the water after churning gave an indication of the contamination which cream would receive from the churn.

Washing with hot water and washing powder or lime, with a rinsing with cold water, immediately succeeding churning gave variable and unsatisfactory results. The bacterial content of the test water was sometimes increased nearly 300,000 per cubic centimeter. The use of hot water alone, hot water and washing powder, or hot water and a commercial germicide containing chlorine, before churning gave more uniform and more satisfactory results. The bacterial content of the water was usually reduced to below 10,000 per cubic centimeter.—L. A. R.

1316. *Beitrag zur Kenntnis der Bakterien von Typus des *Bacterium casei*  $\delta$  von Freudenreich.* (Contribution to the Knowledge of the Bacteria of the Type of the *Bacterium casei*  $\delta$  of von Freudenreich.) R. BURRI AND W. STAUB. Verhandl. schweiz. d. naturf. Gesellsch. 99 Jahresvers., Sept. 1917 in Zurich, 252-253 (1919).

All strains of *Bacterium casei*  $\delta$  investigated produce much gas in the presence of lactose and a suitable source of nitrogen, practically all of which is CO<sub>2</sub>. These strains are very particular as to their source of nitrogen; peptones are especially favorable. It may, therefore, be understood that when this organism is inoculated into milk it develops very slowly. In cheese, favorable conditions for its development must be produced by a progressive decomposition of the protein at the beginning of the ripening. This may be brought about through the action of the rennet enzymes as well as by *Bact. casei*  $\alpha$ , *Bact. casei*  $\epsilon$  and cocci. In solid media the CO<sub>2</sub>-formation is distinctly accelerated.

*Bact. casei*  $\epsilon$  is not present in fully ripened cheese, therefore, it is not the chief cause of the ripening. Sometimes  $\alpha$  is more numerous than  $\delta$ . *Bact. casei*  $\delta$  and propionic acid bacteria are essential to the eye formation. Our knowledge of the normal cheese ripening bacteria is much less than that of the bacteria which cause the different milk and cheese defects. (Zentbl. f. Biochem. U. Biophysik, 1920, 22, 120.)—L. A. R.

1317. *Sul comportamento del "Bacterium coli" nel latte.* (The Behavior of *B. coli* in Milk.) C. GORINI. Policlin., Roma, 1920, 27, 427-429.

The diagnostic value of the coagulating power of *B. coli* on milk is more or less uncertain, due to the different behavior of various strains. The author's work shows that *B. coli* behaves in milk cultures in a different manner according to its potential acid-producing property. Two types are established: a vigorous acid-producing type, which coagulates milk, even when the latter has acquired a brownish tint due to some modification of the milk, and a weak acid-producer which coagulates milk which has not acquired a brownish tint during sterilization. (A white colored milk may be produced by avoiding excessive sterilization.)

The vigorous acid-producer is found mostly in forage, while the weak acid-producer is found in bovine and human feces.—P. M.

1318. *Untersuchungen über zweckmässige Kultivierungsmethoden für die Bakterien der frischen-molkenen Kuhmilch.* (Studies on Practical Methods for the Cultivation of the Bacteria in Fresh Cows' Milk.) WALTER MEIER. Centralbl. f. Bakteriologie (etc.), Jena, 2. Abt., 1918, 43, 433-459.

The author first makes a comparative study of the usefulness of different gelatin and agar nutrient media for a bacteriological study of the fresh cows' milk. Six different gelatin media and 18 agar media were tested. Studies of nutrient gelatin with and without peptone, of whey gelatin with and without peptone, as to their suitability for bacteriological study of fresh cows' milk by means of plate cultures, showed that those media lacking peptone were quite uniformly better than those containing peptone. A detailed discussion is given of the results. Agar cultures held 10 days at 30°C. gave a maximum final number of colonies.—R. E. B.

## COMPARATIVE PATHOLOGY

(See also Numbers 1234, 1235, 1236, 1237, 1238, 1240, 1477)

1319. *Mycosis of the Bovine Fetal Membranes Due to a Mould of the Genus *Mucor*.* T. SMITH. J. Exper. M., N. Y., 1920, 31, 115.

A *mucor* closely resembling Lichtheim's *Mucor rhizopodiformis*, was isolated on agar slants from the diseased chorion of a cow and from the lungs and digestive tract of the fetus. No other organisms were detected in films. Microscopically, the caruncles and the cotyledons, undergoing varying degrees of necrosis, were seen to be penetrated by the branching mycelium which extended into the purulent necrotic foci. No sporangia or chlamydo-spores were seen.

The mould, a typical *mucor*, is described. When spores were inoculated intravenously into rabbits, they produced local foci in the spleen, liver, kidneys and mesenteric nodes, in which the mycelium could be seen, and from which the *mucor* was again isolated.—W. P. B.

1320. *Tuberculosis in Live Stock. Detection, Control and Eradication.* JOHN A. KIERNAN. U. S. Dept. Agric. Farm. Bull., 1069, 1920.

There is some tuberculosis among cattle and swine in every state and territory in the Union. In some states the percentage of cattle infected ranges from 5 to 30 per cent, while investigations indicate that less than 1 per cent of the total of beef and dairy cattle is tuberculous. The cause of the disease, how it spreads among cattle and swine, symptoms and methods of diagnosis are discussed. Various methods for making the tuberculin test are given. These include the subcutaneous, intradermal and ophthalmic tests. The subcutaneous test is the one principally used by the United States Bureau of Animal Industry. A campaign for the eradication of the disease is presented in the paper.—S. H. A.

1321. *Heilveruche die Lymphangitis epizootica. (Investigation in Treatment of Epizootic Lymphangitis.)* K. DAHLENBURG. Berl. tierärztl. Wchnschr., 1920, 36, 39.

The author tried several methods of treatment: Deutschman's serum; Weil's method of injecting blood from treated horses; intravenous injection of collargol together with the external application of collargol salve; methylene blue and a methylene blue-silver preparation; arsenic with the external use of salicylic acid, naphthalene salve and saltpeter. All these preparations he found inefficacious in the treatment of this disease.—J. T.

1322. *Beitrage zur Ätiologie der Geschwürigen Lymphangioitis. (The Etiology of Ulcerative Lymphangitis.)* R. MANNINGER. Berl. tierärztl. Wchnschr., 1920, 36, 49-50.

In a bacteriologic study of ulcerative lymphangitis in horses at Budapest, Manninger found *Corynebacterium pseudotuberculosis* (Preis-Nocard) in 2 cases. In 2 other cases he found a non-proteolytic, non-motile, Gram-positive organism, which did not ferment dextrose, lactose, saccharose, maltose, mannite and glycerine; and a Gram-positive proteolytic organism which did not ferment the aforementioned carbohydrates. Morphologically the latter resembled the Preis-Nocard bacillus, but culturally was different. In 5 other cases he found a diplostreptococcus, which appeared as diplococcus in pathologic processes, but in fluid media, as in bouillon, it formed long chains sometimes containing 30 members. The author did not have an opportunity to test the pathogenicity of these organisms on horses.—J. T.

1323. *Die Immunisierung gegen Rauschbrand mit Keimfreien Filtraten. (Immunization against Blackleg with Germ-Free Filtrate.)* E. GRÄUB AND W. ZSCHOKKE. Berl. tierärztl. Wchnschr., 1920, 36, 99.

This is a preliminary report on this method of immunization, in which guinea pigs, sheep and cattle have been used. One injection produced long immunity, which however was weak and uncertain. But when animals so treated were subsequently vaccinated with attenuated blackleg material their immunity was greatly enhanced.—J. T.

1324. *Zur Frage der Viehverluste durch Kribbelmücken (Simulium reptans). (Regarding Live-stock Losses through S. reptans Infestation.)* STEDEFEDER. Berl. tierärztl. Wchnschr., 1920, 36, 15-17.

The author discusses several cases of hemorrhagic septicemia in cattle and in swine in which the bipolar organism was demonstrated bacteriologically. These outbreaks were associated with heavy infestation of *S. reptans* and followed dry, sultry weather, when even harmless flies have a tendency to bite. The incubation period indicates bacterial rather than alkaloidal intoxication.—J. T.

1325. *Beitrage zur Ätiologie der Zahnkaries beim Pferde. (The Etiology of Dental Caries in the Horse.)* B. KAHNERT. Berl. tierärztl. Wchnschr., 1920, 36, 7.

The conclusions of this inaugural dissertation indicate: (1) In the horse, as in human beings, dental caries is not caused by any one specific organism; (2) as the important bacterial causative agents, are found *Bacillus subtilis*, Bacilli "e" and "u" and also Coccus "q;" (3) a variety of other organisms which are found in the oral cavity of horses must be considered in the etiology of caries, especially acid-forming and proteolytic organisms; (4) some of the organisms are identical with those found in caries of man; (5) bacillary infections predominate, cocci are less frequently found.—J. T.

1326. *Intravenöse Adsorptionsbehandlung mit Incarbon. (Intravenous Adsorption Treatment with Incarbon.)* R. MIDDELSDOFF. Berl. tierärztl. Wchnschr., 1920, 36, 25-26.

Middelsdorf reports extraordinarily good results in treatment of tetanus, lumbago, asuturia, urticaria, found in horses and in lupinosis in cattle by the intravenous injection of incarbon (Merck, Darmstadt) a carbon obtained from animal blood.—J. T.

1327. *Grippeähnliche Erkrankung der Maultiere in Depot Zitten. (Grippe-like Disease of Mules in the Depot of Zitten.)* ZWICKY. Schweiz. Arch. f. Thierh., Zurich, 1919, 61, 327-332.

The author describes an outbreak of a contagious disease of the respiratory apparatus among 500 to 600 mules in which 100 were lightly and 50 heavily affected. It occurred during a damp, cold period, and travelled from stall to stall. The disease is similar to grippe in man.—S. A. G.

1328. *Ein Beitrag zur Kenntnis der Sog. Retinitis septica (Roth).* (A Contribution to the Knowledge of the So-called Septic Retinitis (Roth).) E. KRÜCKMANN. Virchow's Archiv. f. Path. Anat. (etc.), Berl., 1920, 227, 227.

This form of retinitis is characterized by red and white spots, the former due to hemorrhage; the latter, to necrotic nerve substance next to glia fat cells. It is free from exudate. This is associated with a malignant endocarditis, embolic nonsuppurative localized nephritis with numerous hemorrhages, and very often splenic infarcts. The causative agent is a streptococcus.—S. A. G.

1329. *Die Magenwurmseuche der Gänse.* (Stomach Worm Infestation in Geese.) BUGGE. Berl. tierärztl. Wehnschr., 1920, 36, 6.

Bugge describes a disease in geese caused by *Strongylus nodularis*, resulting in high mortality in severely infested birds, especially in the young. The author gives symptoms, pathologic anatomy, preventive measures, and suggests preparations of ether and creolin as of possible therapeutic value.—J. T.

1330. *Some Phases of Beekeeping in Connecticut.* W. E. BRITTON. J. Econom. Entomol., Concord, N. H., 1920, 13, 91-95.

Different phases of beekeeping are discussed, including inspections for foulbrood. In 1910, when the first inspections were made, European foulbrood was present in more than 75 per cent of the apiaries and nearly 50 per cent of the colonies were infected. Though only a portion of the apiaries have been inspected each year, there has been a gradual decrease in this bee disease until 1919, when only 6.6 per cent of the apiaries and 1.2 per cent of the colonies were infected.

On the contrary, American foulbrood has been increasing. In 1910 to 1913 none was reported, but from 1914 to 1919 the percentage of colonies infected with American foulbrood has increased from 0.7 to 1.1 per cent.—Z. N. W.

## PARASITIC DISEASES

(See also Numbers 1335, 1329)

1331. *Crescentic Bodies in Aestivo-Autumnal Malaria: Their Migration and Attachment to the Surface of the Red Corpuscle.* M. R. LAWSON. J. Exper. M., N. Y., 1920, 31, 201.

The crescents are described as extracellular, wrapping themselves around the corpuscles, and encircling "mounds of hemoglobin substance" with their cytoplasm for the purpose of attachment and assimilation. It is believed that they destroy more than one red corpuscle since a heavily pigmented parasite may be seen invading an apparently fresh unaltered red corpuscle, suggesting that the pigment had been obtained from another erythrocyte.

The paper is illustrated with 56 micro-photographs of crescents.—W. P. B.

1332. *The Amebic Dysentery Carrier—The Effects of the Infection on the Individual and the Community with Some Observations on Its Treatment.* WILLIAM MACADAM. Indian J. M. Research, Calcutta, 1919, Special Indian Science Congress Number, 135-141.

In communities where this disease is prevalent it is not feasible to isolate and treat carriers as a means of preventing the spread of the disease but from the standpoint of the health of the individual carrier the disease should be treated. The author thinks best results are obtained by giving emetine both by mouth and hypodermically daily for 12 days, using 1 grain for injection and  $\frac{1}{2}$  grain by mouth. Emetine bismuth iodide proved to be too nauseating and its use was discontinued.—A. L. W.

1333. *Human Intestinal Protozoal and Helminthic Infections Observed in Malta.* THOS. BENTHAM. Parasitology, Lond., 1920, 12, 12-82.

The results of two years' examination of stools of patients invalided to one station in Malta.—W. A. R.

1334. *Observations on Bilharziasis amongst the Egyptian Expeditionary Force.* P. MANSON-BAHR AND N. H. FAIRLEY. Parasitology, Lond., 1920, 12, 33-71.

The authors present many important data based on the dissection of over 10,000 snails, experimental infections of monkeys, and on observations on troops stationed in districts heavily infested with bilharziasis. The results confirm in a remarkable manner the investigations of Leifer, and Thompson and Cockin, both as regards the duality of the species of Schistosomidae, and as regards the selective affinity of *S. haematobium* for molluscs of the genus *Bulinus* and of *S. mansoni* for those of the genus *Planorbis*.

Artificial schistosomiasis was produced in 24 monkeys, 4 being with *S. haematobium* and 20 with *S. mansoni*. In most cases, infestation was via both the skin and upper alimentary tract; but in 2, infestation was by infected drinking water, in 6 others by the skin route only.

Marked pruritus was a prominent manifestation in these monkeys, and similar results were observed on the arms and legs of Arab boys who collected snails for the work. In the most heavily infected zones this itchiness was so marked that sometimes the boys voluntarily left the water on that account. In these cases, even within 20 minutes, whitish papular elevations, the size of a small pin head appeared closely together over the skin of their extremities, but never persisted for more than 48 hours.

Detailed observations on the morphology and life cycles of the two species; on the habitat of the adult worms in the veins, and on the method of deposition of ova in the tissues are presented.

As for prophylactic measures, the destruction of ova in the excreta prior to contamination of the water does not seem feasible, nor does the alternative of the destruction of intermediary hosts. It is suggested that it might be possible to greatly minimize the spread of the disease by attaching some kind of a mechanical device, such as a wire gauze filtering apparatus, to the lock gates so as to intercept the masses of floating weeds with the contained snails which could then be thrown on to the banks and destroyed. Care must be taken to prevent the entry of infested snails into storage tanks.

Chemical purification of water supplies is impracticable. The presence in water of infested *Planorbis* or *Bullinus* or even infested snails of these genera is sufficient evidence on which to condemn that supply for drinking or bathing purposes.

Personal prophylaxis must take account of the danger in hunting in flooded fields and marshes in the vicinity of native villages, and of a considerable danger in fishing, apparently from handling newly caught fish in the sweet water canal. Those addicted to fishing should be warned to wear rubber gloves, as should those whose duties consist in obtaining water from canals. There is considerable danger even in riding through infested water or, for instance, in watering horses.—W. A. R.

1355. *On the Occurrence of a Supplementary Chromatic Body in Maupasella nova Clépède (Ciliata Astoma) an Intestinal Parasite of Earth-worms (Allolobophora caliginosa Savigny).* D. KEILIN. Parasitology, Lond., 1920, 12, 92-94.

In many specimens of *M. nova* collected near Paris, was found a ribbon-like supplementary chromatic body, of varying shape and form, and showing no continuity with the nucleus. Its origin, nature, and function are problematic.—W. A. R.

## TROPICAL DISEASES

(See also Number 1358)

1356. *Etiology of Yellow Fever. X. Comparative Immunological Studies on Leptospira icteroides and Leptospira icterohaemorrhagiae.* H. NOGUCHI. J. Exper. M., N. Y., 1920, 31, 135-153.

The author presents the results of a comparative study of agglutination, lysis, complement fixation and Pfeiffer's reaction on *Leptospira icteroides* and *Leptospira icterohaemorrhagiae*. Monovalent immune sera were prepared for 4 strains of *L. icteroides* by injecting rabbits intravenously with 2-4 cc. of live cultures on rabbit serum medium at 7-14 day intervals several successive times, and similarly for 6 strains of *L. icterohaemorrhagiae*; and a polyvalent immune horse serum was prepared by injecting 20-200 cc. of rich live cultures on horse serum medium of 5 *icteroides* strains intravenously at intervals for 15 doses over a 65-day period, aggregating 2500 cc. These were tested against 5 *L. icteroides* and 7 *L. icterohaemorrhagiae* strains.

Agglutination tests were carried out using 1 cc. of a rich culture grown 2-3 weeks at 26°C. on rabbit serum medium and 0.2 cc. of the fresh immune serum to be tested, with similar normal serum controls, incubating 2 hours in a 37°C. water bath, and examining under the dark field. An immune serum acting upon the homologous strain would cause agglutination into rather large masses, the individual organisms at first mobile, but in high-titer serum becoming immobile, gradually losing their elementary windings and becoming stiff, irregularly granular filaments. Each of the 3 monovalent *icteroides* immune sera tested agglutinated all 5 *Leptospira icteroides* strains, in each case the homologous strain more strongly than the heterologous ones, and except for a very slight agglutination in a few cases these anti-*icteroides* sera failed to agglutinate the 7 *L. icterohaemorrhagiae* strains used. Similarly 6 anti-*icterohaemorrhagiae* monovalent immune sera strongly agglutinated 7 *L. icterohaemorrhagiae* strains, but failed to agglutinate the *icteroides* strains, except a few very slightly.

At the same time Pfeiffer's phenomenon was tested, by mixing 1 cc. of a given immune serum in a Petri dish with 1 cc. of a rich live culture and injecting immediately into the peritoneal cavity of a normal guinea pig. The peritoneal fluid was withdrawn with a capillary pipette after 30 minutes and 2 hours and examined under a dark field. The reactions between the *icteroides* immune sera and the *icteroides* strains were prompt and complete, the organisms appearing first to be agglutinated into large masses and then quickly disintegrated, sometimes as quickly as 15 minutes. The same results were observed between the anti-*icterohaemorrhagiae* sera and the *icterohaemorrhagiae* strains, but only rarely and in slight degree between the sera of one *Leptospira* and any of the strains of the other type, and not at all with normal sera.

Complement fixation tests were made, using as antigens rich cultures of the leptospirae grown in rabbit serum media, killed by heating 10 minutes in the water bath at 60°C. Complete fixation took place when the immune sera were mixed with the homologous strains both in the case of *L. icteroides* and *L. icterohaemorrhagiae*, and there was only a limited degree of cross-reaction between the two.

Special protective substances were demonstrated both in the monovalent and polyvalent icteroides immune sera which protected guinea pigs against many times the lethal doses of various strains, heterologous as well as homologous, of *L. icteroides* but not against comparable doses of strains of *L. icterohaemorrhagiae*. And similarly, neutralizing antibodies were found in anti-icterohaemorrhagiae sera for icterohaemorrhagiae strains, but only in very slight degree for icteroides strains.

Finally, guinea pigs, which had recovered from an icteroides infection, sometimes were resistant to subsequent icterohaemorrhagiae infection, and at other times succumbed, which would indicate that icteroides was closely related immunologically to icterohaemorrhagiae.—W. P. B.

1337. *Etiology of Yellow Fever. XI. Serum Treatment of Animals Infected with Leptospira icteroides.* H. NOGUCHI. J. Exper. M., N. Y., 1920, 31, 159-168.

Guinea pigs inoculated with lethal doses of *L. icteroides* were treated with icteroides immune serum at varying intervals afterward, and the effect in development of clinical symptoms and pathological lesions, particularly hemorrhagic foci in the lungs, studied. The serum was injected daily intraperitoneally in amounts of 0.001, 0.01, 0.1 and 1 cc. at intervals of 1, 24, 48, 72, 96 hours and even 5, 6 and 7 days after inoculation. Depending somewhat on the virulence of the strain, but more on the promptness of instituting treatment, the serum was found to be of definite advantage in checking the progress of the infection. When administered during the period of incubation the serum was found capable of completely preventing the development of the disease, although on subsequent examination hemorrhagic lesions were found in the lungs of the guinea pigs which survived. In the early stages the serum modified the course of the disease, with eventual recovery of the animals, but in later stages when jaundice and nephritis had been present for several days, no beneficial effects were perceived.—W. P. B.

1338. *Frambesia Tropica (Yaws).* H. GOODMAN Arch. Dermat. & Syph., Chicago, 1920, 2, 7-26.

The author summarizes his study of 10 cases of *Frambesia tropica* seen in Porto Rico and Panama. He demonstrated the *Spirochaeta pertenue* in each instance and agrees with the findings of others that it cannot be differentiated morphologically from *S. pallida*. Wassermann tests were positive in every case.

He reviews the history, occurrence, etiology, contagiousness, clinical manifestations, histopathology, serology and differential diagnosis from syphilis. An extensive bibliography is included.—R. D. H.

1339. *Treatment of Malaria by Quinine.* P. HEHIR. Indian J. M. Research, Calcutta, 1919, Special Indian Science Congress Number, 89-100.

The author points out the failure of quinine to cure all cases of chronic malaria whether given orally or parenterally, in large or small doses, and for a short or long period. He believes it the best drug for the purpose, however, and advocates treating malaria early in its course by large doses of quinine for 3 weeks, with smaller doses continued subsequently.—A. L. W.

1340. *Note sur l'existence chez l'homme de formes évolutives du spirille de la fièvre récurrente. (The Occurrence of Involution Forms of the Spirochete of Relapsing Fever.)* ARDIN, DELTEIL AND DERRIEU. Bull. Acad. de méd., Par., 1920, 53, 198-201.

The authors have found all of the intermediate forms between the extrusions on the surface of the protozoa and the fusiform bodies found free in the spinal fluid. They think that perhaps lowered resistance in the body may determine the type of reproduction of the protozoa.—G. H. R.

1341. *A Contribution to the Study of Spirochasta morsus-muris in the Nippon Field Vole (Microtus montebelli).* ROKUZO KOBAYASHI AND MAKOTO KODAMA. Kitasato Arch. Exper. M., 1919, 3, 199-206.

These authors found that the frequency of occurrence of rat bite fever spirochetes in field voles differed remarkably according to the localities. All of the strains of rat bite fever spirochetes examined easily infected experimental animals, such as mice, albino rats and guinea pigs, all showing the same clinical symptoms except the nugata field vole strain which did not usually produce any fibrile reaction in guinea pigs. They found that different strains of the spirochetes from different localities possessed a different degree of virulence for Nippon monkeys. They observed that the serum of monkeys inoculated with Saitama field vole strains exercised a strong reaction against all the other spirochete strains, but the serum of the monkey which ran an atypical course gave no immunological reaction against the human and wild rat strains and a slight or no reaction against the field vole strain from the same locality. It seemed that there was no definite relation in the pathogenicity and the production of immune bodies between the two sets of strains from two different localities and that an immune serum prepared with a certain strain reacted in different degrees against other strains from the same locality. The results showed that the serum of a monkey inoculated with a Saitama field vole strain was not always spirocheticidal against other strains but more or less against the homologous strain. This difference seemed to occur in consequence of the

individuality of the monkey. Dark field illumination was used exclusively for the examination of the immunological property of the sera against spirochetes, because this method was easy and as reliable as the Pfeiffer reaction. The conclusion was made that a special position must be assigned to the field vole (*Microtus montebelli*) in the immunological studies of rat bite fever spirochetes.—R. T.

1342. *Le premiere cas de contagion du bouton d'Orient en France. (The First Case of Contagion of Tropical Ulcer in France.)* P. RAVAUT. Bull. Acad. de méd., Par., 1920, 83, 198-201.

This disease was contracted in France. The bodies of Leishmann were demonstrated in the tissues microscopically. Treatment with neosalvarsan diminished the size of the lesions.—G. H. R.

## MEDICAL ENTOMOLOGY

(See also Number 1239)

1343. *Les conditions de nutrition des anophèles en France (Anopheles maculipennis) et le rôle du bétail dans la prophylaxie du paludisme. (The Conditions of the Nutrition of Anopheles Mosquitoes (Anopheles maculipennis) in France and the Role of Cattle in Malarial Prophylaxis.)* E. RUBAUD. Ann. de l'Inst. Pasteur, Par., 1920, 34, 181-228.

In the marshes of the Vendée and the region around Paris, in France, the anopheles mosquito is found in abundance. In contrast to this, malaria is decreasing in the Vendée and did not increase during the war when soldiers infected with malaria were sent into these regions. The author attempts to explain this condition which he calls "anophelism without paludism." The mosquito was found to be as susceptible as formerly to infection with the malarial parasite. The absence or decrease of malaria is apparently due to the preference which the anopheles mosquito has for the blood of cattle. In the Vendée, the stables contained myriads of *A. maculipennis*, while the adjacent human habitations were almost free from this type of mosquito. The anopheles mosquito was found frequently upon cattle, engorged with the blood of these animals, but rarely found biting man. The cattle, therefore, were considered to serve man as a protection against malaria, by their attraction of the mosquito.—S. B-J.

1344. *On Coloration in Ticks. II.* G. H. F. NUTTALL. Parasitology, Lond., 1920, 12, 1-6.

In an earlier paper (1913) the author had called attention to differences in color of living and dead ticks. The present paper illustrates by two plates the coloration as seen in living examples of *Amblyomma hebraeum*, and *A. gemma*, *Dermacentor venustus*, *D. variabilis*, and *D. reticulatus niveus*, and the desirability of recording the colors of ornate ticks when alive is indicated.

A remarkable and hitherto unobserved change in color of living specimens of *Amblyomma hebraeum* is described and the change taking place after a prolonged sojourn (74-141 days) on the host is figured. A few notes on the source of coloration are added.—W. A. R.

1345. *Regeneration of the Mouthparts and Legs in Ticks.* G. H. F. NUTTALL. Parasitology, Lond., 1920, 12, 7-26.

Amputation experiments upon immature stages of *Argas persicus* (Oken, 1818), *Amblyomma hebraeum* (Koch, 1844), and *Hyalomma aegyptium* (Linnaeus, 1746), show that the mouthparts and legs of these ticks may be more or less regenerated when mutilated shortly after the ticks have abandoned the host in a fully engorged condition.—W. A. R.

1346. *Spermatogenesis in Ixodes ricinus Linn.* E. NORDENSKIÖLD. Parasitology, Lond., 1920, 12, 159-166.

The present paper amplifies and corrects in a number of particulars an earlier publication (1909) by the same author. It is concluded that the spermatozoon of the tick is atypical and, like that of several crustaceans, cannot be compared with regard to its several components with the common spermatozoon type.—W. A. R.

1347. *Yeasts and Insects.* J. PERCY BAUMBERGER. J. Exper. Zool., 1919, 28, 1-81.

Experiments show that *Drosophila* living in fermenting fruit are dependent for their food supply on the synthetic and absorptive powers of yeast-cells. Similarly, in studying the relation of *Musca domestica* to manure, of *Desmometopa* to decaying meat, of *Sciara* and *Tyroglyphus* to wood, the investigator finds that all these arthropods feed on microorganisms. The general suggestion is made that insects inhabiting fermenting and decaying substrata of low protein content usually feed upon the microorganisms present, and thus benefit by the power of the fungi to extract, absorb, and synthesize many non-protein nitrogenous compounds. (J. A. T. in J. Roy. Micr. Soc., Lond., 1919, 249, 349.)—E. B. F.

1348. *Kribbelnücken. (Two-winged Flies.)* K. FRIEDRICH. Berl. tierärztl. Wchnschr., 1920, 36, 13-15.

Friedrich discusses the difference between *Simulium reptans* and *S. argyreatum*.—J. T.

1349. *On Two New Gregarines, Allantocystis dasyhelei* n. g., n. sp. and *Dendrorhynchus systeni* n. g., n. sp., Parasitic in the Alimentary Canal of the Dipterous Larvae, *Dasyhelea obscura* Winn; and *Systenus* sp. D. KIELIN. Parasitology, Lond., 1920, 12, 154-158.

The peculiar character of *Allantocystis dasyhelei* is found in the fact that when two sporonts associate for reproduction, instead of contracting and forming a spherical cyst, they secrete a very elongated, sausage-like cyst. Within this the spindle-shaped sporocysts are found.—W. A. R.

1350. *Intestinal Helminths in Indians in Mesopotamia* C. L. BOULENGER. Parasitology, Lond., 1920, 12, 95-97.

The total number of Indians examined was 1180, chiefly dysentery cases and patients convalescent from that disease but including also 200 healthy controls.

Of nine species of helminths found, the percentages for the commoner parasites, e.g., *Ascaris lumbricoides* 5.2 per cent, seem very low as compared with various figures for natives examined in India. 18.5 per cent of hookworm infection included both *Necator* and *Ancylostoma*.—W. A. R.

1351. *The Ascaris lumbricoides as the Cause of Urgent Symptoms in Diseases Amongst Children.* C. PENTLAND. Practitioner, Lond., 1920, 104, 313-315.

The frequency of this condition is discussed. Three case histories are given.—C. P. B.

### EPIDEMIOLOGY

1352. *The Change of Type of Disease.* HUMPHREY ROLLESTON. J. Am. M. Ass., Chicago, 1920, 74, 1495.

Scarlet fever has become much milder, while the amount of scarlet fever and its infectivity have not decreased greatly. Mortality and virulence have decreased. Virulence and mortality from pneumonia have increased. Such changes may be due to bacteriological factors and alterations of resistance of patients. Bacteria may vary in virulence as a result of external conditions or spontaneously. Temperature, climatic factors, concentration of their carriers and hosts and condition of passage may influence vitality and virulence of bacteria. There may also be cycles of infectious activity alternating with periods of rest. Furthermore, changes in disease may be due to different strains of the same organism. Variation in resistance of the patient may be due to alteration of mode of living, environment, overcrowding, overwork, bad food, alcoholism and other similar conditions.—P. G. H.

1353. *Water-Borne Typhoid Fever Outbreaks in Tonawanda, N. Y.* THEODORE HORTON. Pub. Health Rep., 1920, 35, 391-399.

An account of 236 cases occurring in Tonawanda, N. Y., during the period from July 5 to October 4, 1919, due to a break in the intake pipe of the water supply system. A chlorination plant was installed, following which the number of cases at once decreased. The effectiveness of chlorination was demonstrated by the fact that there was no increase in the number of typhoid fever cases developing as a result of a new leak into the intake pipe.—I. A. B.

1354. *Causes of Typhoid Fever in Massachusetts.* GEORGE T. O'DONNELL. Am. J. Pub. Health, Concord, 1920, 10, 517-520.

The Mass. State Dept. of Health states that flies, food (exclusive of milk), privies and sewage, are not an important factor in the spread of typhoid fever at the present time in the state. There are few cases due to water. Milk has been responsible for 8.1 per cent of the total cases reported in Massachusetts during the past 10 years. Contact with clinical cases of typhoid is the most frequent known method of spreading infection. Carriers were proven to be responsible for 4.6 per cent of milk-borne typhoid in 1915-1918, inclusive. Carriers are probably the cause of an appreciable number of typhoid cases of unknown origin.—M. C. P.

1355. *Statistics of Influenza Morbidity with Special Reference to Certain Factors in Case Incidence and Case Fatality.* W. H. FROST. Pub. Health Rep., Wash., 1920, 35, 584-597. A statistical study.—J. W. M. B.

1356. *Ueber Flecktyphus. (Typhus Fever.)* EMIL SCHWEINBURG. Wien. klin. Wchnschr., 1920, 33, 129-30.

A short description of a typhus epidemic in Russia in 1915.—B. C.

### PUBLIC HEALTH REGULATION

1357. *L'Hygiène et ses perspectives: Leçon d'Ouverture, Chaire d'Hygiène, Université de Paris. (Hygiene and Its Prospects: Opening Address, Chair of Hygiene, University of Paris.)* LÉON BERNARD. Presse méd., Par., 1920, 28, 201.

A historical review of hygiene, emphasizing the importance of international coöperation; a consideration of the present day problems, chief among which are placed alcohol and housing.—L. A. K.



1358. *Resumé of Methods for Control of Malaria; Indications; Results; Costs.* H. R. CARTER. Am. J. Pub. Health, Concord, 1920, 10, 528-532.

Three methods for the control of malaria are: get rid of *Anopheles* mosquitoes; prevent the infection of the mosquito; and prevent access of any *Anopheles* mosquitoes to man. The method must be suited to conditions. The method is best which gives sufficient control of malaria at the least cost.—M. C. P.

1359. *Malaria Control through the Application of Anti-Mosquito Measures and Some of the Results Obtained in Southeast Arkansas.* H. A. TAYLOR. South. M. J., Birmingham, 1920, 13, 339-343.

The author claims a very marked reduction in the amount of malaria in this district following the institution of anti-mosquito measures. A reduction of 88 per cent in the number of calls made for malaria is shown at a cost of only 84 cents per capita.—J. H. B.

1360. *The Aftermath of Malaria Control in Extra-cantonment Areas.* J. A. LEPRINCE. South. M. J., Birmingham, 1920, 13, 413-415.

The author calls attention to the education received during the war by business men, farmers, etc., in malaria prevention. He believes a continuation and extension of the work is now possible.—J. H. B.

1361. *The Control of Malaria for a Railroad System, Based on the Experience of the St. Louis Southwestern during 1917, 1918, 1919.* H. W. VAN HOVENBERG. South. M. J., Birmingham, 1920, 13, 418-422.

The author feels that the results of the campaign conducted by the railroad have been most valuable and should encourage other companies to institute similar measures.—J. H. B.

1362. *Relation of Drainage Projects to Malaria Control.* J. I. HERRITAGE. South. M. J., Birmingham, 1920, 13, 424-426.

A brief plea for the reclamation of land, both for its agricultural value and its aid in the eradication of malaria.—J. H. B.

1363. *Malaria Control from the Engineering Point of View.* W. C. STROMQUIST. Am. J. Pub. Health, Concord, 1920, 10, 497-501.

The four lines of attack are: Mosquito eradication, protection of well persons against infected mosquitoes, segregation of infected persons from non-infected mosquitoes, and the reduction of the number of infected persons through quinine treatment. The first three are essentially engineering problems.—M. C. P.

1364. *Antimalarial Work in Dallas, Texas.* L. C. FRANK AND T. R. SHAW. Pub. Health Rep., Wash., 1920, 35, 534-535.

The cost of carrying out anti-malarial measures and the average death rate from malaria of the three years, 1917 to 1919, are given.—I. A. B.

1365. *Community Medicine and Public Health.* ERNST C. MEYER. Am. J. Pub. Health, Concord, 1920, 10, 489-497. Lower cost of medical service through better administration and the establishment of pay clinics is recommended.—M. C. P.

1366. *Manikürinfektionen. (Manicure Infections.)* HERBERT KÖRBL. Wien. klin. Wchnschr., 1920, 33, 127-128.

Not only are finger infections due to manicuring quite numerous, but often very serious. The use of unsterile manicuring instruments and salves is a prolific cause for the spread of disease. Education of the public in this matter, as well as the licensing of manicurists is recommended as a remedy.—B. C.

## INDUSTRIAL HYGIENE

1367. *Value of Plant Records in the Development of Plant Hygiene.* A. R. HACKETT. Am. J. Pub. Health, Concord, 1920, 10, 525-527.

Properly kept medical records would be of service in developing plant hygiene.—M. C. P.

1368. *Self-imposed Inspection of the National Cannery Association.* H. M. LOOMIS. Am. J. Pub. Health, Concord, 1920, 10, 521-525.

Manufacturers, on their own initiative, have instituted inspection to improve, standardize and certify their own canned goods. The inspection requires use of good original material, proper processing, supervision of the health of employees and improved sanitation of factories.—M. C. P.

## RURAL SANITATION

1369. *Typhoid Reduction in South Carolina.* L. A. RISER. J. Am. M. Ass., Chicago, 1920, 74, 1641.

The reduction of typhoid fever is largely a matter of education and is accomplished by educational work and building of privies, even without vaccination. A suitable county health organization is necessary to obtain satisfactory results.—P. G. H.

## SANITARY ENGINEERING

(See also Number 1363)

1370. *Anti-Malaria Work in the Aegean*. Editorial. Sci. & Indust., Australia, 1920, 2, 22-23.  
During 1916-1918 the marshes of the Aegean Islands in the zone of military activities were treated in the usual manner, by draining or spraying, with the usual successful results.—Z. N. W.

## DISINFECTION AND GROWTH INHIBITION

(See also Numbers 1287, 1418, 1483, 1524)

1371. *The Germicidal Value of Potassium Mercuric Iodide*. D. MACFARLAN. Am. J. M. Sc. Phila., 1920, 159, 586-592.

The author reports further studies upon the value of potassium mercuric iodide as a germicide. This chemical besides its high germicidal potency possesses other distinctive and valuable features over other mercury and iodine salts, such as ready solubility in both water and alcohol, also acetone; it is much less toxic than mercuric chloride; is less irritating to the tissues; non-precipitation of proteins. Organic matter does not reduce its germicidal action as is the case with many other antiseptics and germicides. The author, with the assistance of Dean, studied the germicidal action of potassium mercuric iodide, and reports results of tests against *Staphylococcus albus*, *B. coli communis* and *B. subtilis*. The technic employed is outlined; also tests in the presence of organic matter (human blood serum) are reported.

In a discussion of the results the author calls attention to the powerful germicidal action in high dilution of potassium mercuric iodide and the slight influence of organic matter upon its potency. He concludes by stating that "these facts, taken in consideration with its great solubility, its freedom from irritant action and its comparatively low toxicity in the solutions efficacious for germicidal purposes would seem to recommend this double salt of the iodides of potassium and mercury as the most desirable of the inorganic germicides."—L. W. F.

1372. *Vergleichende Untersuchung von drei Desinfektionsmitteln auf keimtötende Kraft*. Bericht über die 43. ordentliche Mitgliederversammlung der Wissenschaftlichen Station für Brauerei in München. (Comparative Studies on Three Disinfectants with Respect to Their Germicidal Value.) R. HEUSS. Ztschr. f. d. ges. Brauwesen, München, 1919, 42, 329.

Studies were made of disinfectants termed "pyrizit" and disinfectants No. 1 and No. 2. The composition of these is not given in the author's abstract.—R. E. B.

1373. *Die keimtötende Kraft von elektrolytisch dargestellter Hypochloritlauge ("Antiformin")*. Mitteilungen der Wissenschaftlichen Station für Brauerei in München. (The Germicidal Power of Electrolytically Prepared Alkaline Hypochlorite (Antiformin).) R. HEUSS. Ztschr. f. d. ges. Brauwesen, München, 1919, 42, 351.

A study is reported of the method of preparing hypochlorite or antiformin by electrolytic means, and a comparison made of the germicidal value of antiformin prepared in this manner with antiformin as usually prepared.—R. E. B.

## WATER AND SEWAGE BACTERIOLOGY

(See also Numbers 1231, 1353)

1374. *Report of Committee on Sanitation of Swimming Pools*. Am. J. Pub. Health, Concord, 1920, 10, 540.

The result of the investigation would indicate that little had been done to regulate the sanitation of swimming pools.—M. C. P.

1375. *An Inferential Index of Swimming Pool Purity*. GORDON M. FAIR. Am. J. Pub. Health, Concord, 1920, 10, 502-508. The author suggests score cards for swimming pools and discusses various indices for deciding minimum sanitary requirements for pools.—M. C. P.

1376. *Elements of the Theory Underlying the Disinfection of Water by Ultra Violet Light*. G. M. FAIR. J. Am. Water Works Ass., Balt., 1920, 7, 325-342.

This paper deals with the application of ultra violet light to water and the theory of its action.—F. W. T.

1377. *Influence of Time of Contact of Sterilizing Agent on Water Purification*. A. F. GIRVAN. Engineer. & Contr., Chicago, 1920, 53, 740.

On Thames water with various doses of Cl and of lime the time of contact to produce per cent *B. Coli* reduction is given.—L. P.

1378. *Eijkmans Gärungsprobe bei 46°C. in der Trinkwasseruntersuchung*. (The Fermentation Test of Eijkman at 46°C. in the Investigation of Drinking Water.) G. GRUJNS. Centralbl. f. Bakteriöl. (etc.), Jena, 2. Abt., 1920, 50, 64-71.

Experimental results of the author and others are reported to prove that the fermentation of glucose at 46°C. is a valuable method for the testing of samples of drinking water, in preference to any other method.—S. A. W.

## FOOD BACTERIOLOGY

(See also Numbers 1226, 1368, 1498)

1379. *Summary of Bureau of Chemistry Investigations of Poisoning Due to Ripe Olives.* G. G. DEBORD, R. B. EDMONDSON AND CHARLES THOM. J. Am. M. Ass., Chicago, 1920. 74, 1220.

Spoiled olives are readily recognized by the characteristic odor given off when a can is opened. After standing the odor dissipates and is not easily recognized. Spoiled olives are soft. In order to prevent further outbreaks of poisoning, more efficient methods of sterilization should be applied. When olives are held in bulk before canning they should be kept in such a manner as to exclude undesirable fermentations.—P. G. H.

1380. *A Pink Yeast Causing Spoilage in Oysters.* ALBERT C. HUNTER. Amer. Food J., 1920, 15, 16-19.

A pink yeast was isolated from oysters taken from Narragansett Bay. These yeasts occur widely in nature and belong to a large group of Torulæ. In this instance the oyster boats, bins and utensils of oysterhouses were found to be heavily infected. The surface water of the bay was found to be infected in but a very small proportion of the samples examined and in no case was this yeast present in samples of mud and sand taken from the bottom of the bay. Oysters packed in infected houses are often pink when they reach their destination.

As a method of control, the author recommends that all bins, benches, tubs, etc., with which the oysters come in contact be scrubbed thoroughly with a solution prepared by adding 1 part of commercial formalin to 1000 parts of water. This should be done in the fall before oysters are brought to the opening house and repeated several times during winter.—J. B.

1381. *Ein Beitrag zur Kenntnis der schleimigen Zersetzung von Nahrungsmitteln. (A Contribution to Our Knowledge of Slimy Transformations of Food Material.)* HILDING MAGNUS-SON. Centralbl. f. Bakteriöl. (etc.), Jena, 2. Abt., 1918, 48, 459-469.

The author first discusses the development of slime formation in sausage. The appearance was materially injured but the flavor was still good. The organism which brought this about was not isolated. Two cases of bacteria producing ropy milk were also discussed. In the first case an organism apparently identical with *Bacterium lactis acidi* of Leichmann was secured. In the second, a short non-motile rod, Gram-negative and without capsules was noted. Bacteria were pronouncedly aerobic. He concludes that the organism most closely resembles the *Bacterium lactis viscosum* of Adametz.—R. E. B.

## HEALTH BOARD LABORATORY METHODS

1382. *Die bakteriologische Diagnose der Diphtherie. (The Bacteriological Diagnosis of Diphtheria.)* FRITZ SCHANZ. Berl. klin. Wchnschr., 1920, 57, 210-212.

A discussion of some of the limitations of diagnosis of diphtheria when based on purely morphologic observation of suspected organisms.—B. C.

1383. *Virulence of Diphtheria Bacilli from Diphtheria Patients and from Carriers: The Results of Five Hundred and Forty-eight Tests.* AUGUSTUS B. WADSWORTH. J. Am. M. Ass., Chicago, 1920, 74, 1633.

*B. diphtheriae* from persons who have had diphtheria or from those who through contact become carriers retains its virulence for several months. Changes in virulence and changes in type of the bacillus take place so slowly in the throat that the three months' period required for making virulence tests is a lenient ruling and a satisfactory one if a virulence test is made without delay.—P. G. H.

1384. *A Simple Method for Detecting Faecal Carriers.* W. GLEN LISTON AND S. N. GORÉ. Indian J. M. Research, Calcutta, 1919, Special Indian Science Congress Number, 107-123.

The method described consists of distributing on dry agar slopes definite quantities of a series of definite dilutions of an emulsion of feces to secure a sufficient number of isolated colonies, and is based on the observation that in 140 stools of carriers examined, there was never less than one typhoid or allied organism to 20 of the common intestinal bacteria and that the total number of intestinal bacteria found in feces ranges from one million to one thousand million per cubic centimeter. The authors hold, therefore, that it is not necessary to examine more than 50 isolated colonies. The apparatus and technic used in making the dilutions are described in great detail.—A. L. W.

1385. *Die Eijkmansche Gärprobe. (The Eijkman Fermentation Test.)* HARALD HUSS. Centralbl. f. Bakteriöl. (etc.), Jena, 2. Abt., 1918, 48, 295-321.

The author studied the suitability of the Eijkman fermentation test for the recognition of sewage in water and found that this method enables one to detect impurities with the same certainty as the fermentation test at 37° with consequent isolation and investigation of pure cultures of the organism. Results of the Eijkman gas test should first be noted after 43 to 48 hours.—R. E. B.

1386. *Modification de la méthode de Pappenheim.* (A Modification of the Pappenheim Stain.) E. NAZIM. Presse méd., Par., 1920, 28, (Suppl.), 424.

Methylene blue eosinate 1 per cent in methyl alcohol, 2 parts; Giemsa solution, 1 part. The fresh unfixed blood smear is covered with the stain, placed in a Petri dish to prevent evaporation and left 50-60 seconds for fixation. Add an equal quantity of neutral distilled water, stain 1-2 minutes, wash well and dry. There is much less precipitation than in the Pappenheim method.—L. A. K.

1387. *Comment désinfecter les crachats des tuberculeux.* (The Disinfection of Tuberculous Sputum.) E. ARNOULD. Presse méd., Par., 1920, 28 (Suppl.), 333.

Among chemical methods, the author recommends a solution described by Küss.

Soft soap (potash soap)..... 8 grams

Na<sub>2</sub>CO<sub>3</sub>..... 10 grams

Or NaOH..... 8 grams

35 per cent formalin..... 40 gr.

Water to make one litre. The killing time is from 15-20 hours but is quite reliable.—L. A. K.

1388. *An Improved Concentration Technic for the Detection of Tubercle Bacilli in Sputum.* THEOPHILE RAPHAEL AND NINA ELDRIDGE. J. Am. M. Ass., Chicago, 1920, 75, 245.

The authors suggest an improvement over the Greenfield-Anderson method. The modification consists of placing 5 cc. of the sputum, mixed with 2 volumes of 1 per cent sodium carbonate in 1 per cent phenol solution, in an autoclave and exposing to 15 pounds pressure for 20 minutes. Another modification suggested is the addition of a reagent prepared by mixing equal parts of a 15 per cent sodium hydroxid and Labarraque's solution. Five parts of sputum and one part of this reagent are shaken for 15 minutes, incubated for 1 hour, and centrifugized for 15 minutes. The autoclave modification was found superior to other methods.—P. G. H.

1389. *A Method for Demonstrating Spirochaeta pallida in Regional Lymph Glands.* EDWIN W. SCHULTZ. J. Am. M. Ass., Chicago, 1920, 75, 176.

A 2 or 3 cc. hypodermic syringe with a sharp needle is filled with from 0.5 to 1 cc. of sterile physiologic salt solution and inserted into the gland. The point of the syringe needle is rotated in the gland to break down some of the tissue. The salt solution is then slowly injected into the gland and the point of the needle rotated again. As much as possible of the gland pulp mixture is then drawn into the syringe and slides prepared for dark field examination.—P. G. H.

## DIATHETIC AND DEFICIENCY DISEASES

1390. *Beri-beri.* P. HEHIR. Indian J. M. Research, Calcutta, 1919, Special Indian Science Congress Number, 44-59.

A history of the occurrence of beri-beri among the British troops during the siege of Kut-el-Amara is given. The classical symptoms, dropsy, peripheral neuritis, gastro-intestinal disturbance and cardiac distress were present. Lack of vitamins in the tinned meats and biscuit made from white wheat flour, together with unusual physical labor and hardships are given as the etiological factors. The treatment was rest in bed, general tonics and digitalis, but drugs were of little value. When obtainable, lentils, eggs, milk, brown bread, oatmeal and fish were found beneficial. Beri-beri was not present to any extent among the Indian troops who used a different diet containing more cereal. On the other hand scurvy occurred among Indian troops and not the British. Tables giving the rations of British and Indian troops are set forth.—A. L. W.

1391. *Report on the Anti-beri-beri Vitamine Content and Anti-scorbutic Property of Sun-dried Vegetables.* J. A. SHORTEN AND CHARUBRATA ROY. Indian J. M. Research, Calcutta, 1919, Special Indian Science Congress Number, 60-78.

The vegetables used were carrots, onions, spinach and cabbage. They were scalded or steamed for a few minutes, then dried in the sun and finally compressed into bricks and packed in air-tight tins. These were then soaked and boiled before being fed to the experimental animals. Each of these vegetables given to fowls (5 grams per day of dry material) afforded complete protection from polyneuritis. Carrots, cabbage and onions retained to some extent their anti-scorbutic properties as shown by feeding 1.6 grams daily to guinea pigs on a basal diet of oats, while spinach, 1.6 grams daily, had no anti-scorbutic property.—A. L. W.

## CANCER RESEARCH

(See also Numbers 1215, 1216, 1217, 1218, 1219, 1220, 1221, 1222, 1223, 1224, 1301)

1392. *Lymphocytes and Cancer Immunity.* FREDERICK PRIME. J. Cancer Research, 1920, 5, 105.

In animals naturally or artificially resistant to certain strains of rat carcinoma and sarcoma, even that distinct reduction of the circulating lymphocytes that may be produced by the x-rays is not followed by an appreciable decrease in immunity to tumor inoculation.—W. H. W.

1393. *The Relation of Pregnancy and Reproduction to Tumor Growth. Studies in the Incidence and Inheritability of Spontaneous Tumors in Mice. Problems in the Behavior of Tumors. Tenth Report.* MAUD SLYE. J. Cancer Research, 1920, 5, 25.

Cancer and reproduction, being growth processes, draw upon the same energy and are made possible by the same food. Hence, the energy and nutrition used by one are withheld from the other. Therefore, if a female be constantly pregnant, energy and food are withheld from the tumor and it grows very slowly. If there be a hiatus between pregnancies, the energy consumed by the reproductive process is released and diverted to the tumor, which then grows rapidly. If a tumor considerably antedate impregnation, energy is already being used for the tumor and is with difficulty diverted for pregnancy, probably never entirely so.—W. H. W.

1394. *A Basal-Cell Epithelioma of the Rat.* DUDLEY H. MORRIS. J. Cancer Research, 1920, 5, 147.

This tumor was a very slowly growing variety, not continuously transplantable, but it grew for a long time when re-implanted in its original host. In other words, the tumor not only in its biological qualities, but also in its morphology, resembled very closely the basal-cell tumors of the skin.—W. H. W.

1395. *Pathological Changes Accompanying Injection of an Active Deposit of Radium Emanation. I. Intravenous and Subcutaneous Injections in the White Rat.* HALSEY J. BAGG. J. Cancer Research, 1920, 5, 1.

The injection of an "active deposit" of radium emanation is followed by a diffusion of the radio-active substance throughout the animal's body, which results in pathological changes in the various organs. The most interesting of these is a fatty degeneration of the liver associated with many giant cells and hyperchromatic nuclei. Other changes may be congestion and hemorrhage in practically all the organs, enteritis, granular degeneration of the kidney with erosion of its cells, destruction of the bone marrow, and congestion of the spleen.

Doses of radium less than 10 mc. are sublethal for the white rat; but larger amounts may kill within a few days, the reaction being more severe when the intravenous route has been chosen.—W. H. W.

1396. *Fluctuations in Induced Immunity to Transplanted Tumors.* F. D. BULLOCK AND G. L. ROHDENBURG. J. Cancer Research, 1920, 5, 119.

The degree of immunity obtained by commonly accepted methods of treatment may fluctuate considerably, and the value of experiments in which such variations have not been recognized or eliminated may be greatly impaired. The fluctuations do not seem to depend on technic, small variations in dosage, bacterial contamination, or the type of tissue used for immunization. An important cause appears to be racial differences, for when animals of a pure breed are employed the fluctuations are so small that they may be disregarded.—W. H. W.

1397. *Fluctuations in Concomitant Immunity.* F. D. BULLOCK AND G. L. ROHDENBURG. J. Cancer Research, 1920, 5, 129.

Fluctuations in concomitant immunity frequently occur with both epithelial and connective tissue neoplasms in mice and rats. These are referable neither to racial differences, as is the immunity discussed in the preceding paper, nor to variations in technic. They appear to be due to differences in the tumor itself, and their presence suggests the inconstancy of tumors as immunizing agents.—W. H. W.

1398. *The Relation of Inbreeding to Tumor Production: Studies in the Incidence and Inheritability of Spontaneous Tumors in Mice. XIII. Problems in the Behavior of Tumors.* MAUD SLYE. J. Cancer Research, 1920, 5, 53.

Inbreeding appears not to influence the incidence of cancer.—W. H. W.

1399. *A Study of Four Cases of Beginning Squamous-Cell Carcinoma of Cornifying Type.* R. C. WHITMAN. J. Cancer Research, 1920, 5, 155.

The author concludes that the carcinoma cell is a new species, arising by somatic mutation from a normal cell either existing in a cell rest or occupying a normal relation to the tissues. Although the carcinoma cell represents a new species, it almost always retains enough of the properties of its ancestor to render its points of origin recognizable. The cause of the mutation is obscure.—W. H. W.

1400. *On the Calcium Content of the Blood with Special Reference to Cancer.* OTTO KREHBIEL. J. Cancer Research, 1920, 5, 199.

The blood calcium content was determined in 34 cases of malignant disease, in 6 of benign tumors, in 11 of thromboangiitis obliterans, and in 26 miscellaneous cases. In cancer the average calcium values were within the figures generally accepted as normal, and no characteristic concentration accompanied any given type or location of neoplasm. In benign tumors the results were similar.—W. H. W.

1401. *The Histogenesis of Carcinoma in the Islets of the Pancreas.* E. J. HORGAN. J. Lab. & Clin. M., St. Louis, 1920, 5, 429-442.

This article discusses the embryology and histology of the pancreas and the pathologic conditions of the pancreas found in association with a number of chronic upper abdominal lesions.

"The histogenesis of carcinoma of the pancreas must be studied from portions of the pancreas which are too small to be recognized in the gross specimen as carcinoma. For this reason I selected for the study of the early neoplastic changes a series of cases which show chronic inflammation. In the course of the investigation I found a definite hypertrophy and hyperplasia of the islets of Langerhans. This condition was found in about 25 per cent of the cases of interacinar and interlobular pancreatitis which was associated with chronic gastric and chronic duodenal ulcer. In these hypertrophic islets hypertrophy, hyperplasia, and migration of the cells were observed.

"In the hypertrophic islets I found hypertrophic differentiated cells. Accompanying this cellular hypertrophy the connective tissue within and surrounding the islets had increased to protect the adjacent cells from encroachment.

"In similar islets I sometimes found also hyperplasia of undifferentiated epithelial cells. These undifferentiated cells, however, are distinctly confined within the direct capsule of the islet.

"In some of the hypertrophic islets I found hyperplastic undifferentiated cells migrating through the capsule, a condition which is undoubtedly carcinoma.

"These three graphic descriptions apparently represent the stages of neoplasia as described by MacCarty in other epithelial tissues.

"Simple fibrosis and sometimes hyalinized fibrosis were the only purely inflammatory reactions found in this series."—F. W. H.

1402. *Immunotherapy of Cancer.* C. LEVIN. Berl. klin. Wchnschr., 1919, 56, 1233. (Abs. in J. Am. M. Ass., 1920, 74, 1748.)

A woman of 44 suffering from carcinosis following a carcinoma of the breast extirpated 2 years previously was treated with ascitic fluid from her own peritoneal cavity. After about 6 months of such treatment (combined with x-raying) no clinical trace of carcinoma could be discovered, and the general health had greatly improved.—W. H. W.

1403. *Immunity and the Power of Digestion.* VERA DANCHAKOFF. Biol. Bull., Bost., 1920, 38, 202.

When mixed with adult chicken spleen and transplanted into the chick embryo, the Ehrlich mouse sarcoma and the Crocker Fund mouse sarcoma 180 soon die. The cause of their death is their isolation by the cells of the splenic mesenchyme, which enclose the tumor cells in digestive vacuoles. The lymphocyte takes no part in the process, for the small round-cell infiltration about the graft is composed not of lymphocytes but of hemoblastic elements which eventually differentiate into granular leucocytes.—W. H. W.

1404. *Giant Centrospheres in Degenerating Mesenchyme Cells of Tissue Cultures.* W. H. LEWIS. J. Exper. M., N. Y., 1920, 31, 275-292.

In an earlier paper the author had described in living mesenchyme cells of chick embryos cultivated *in vitro* in a modified Locke's solution, a type of degeneration in which the characteristic picture was the formation of vacuoles of various sizes and granules arranged around the periphery of the centrosphere, a clear zone surrounding and including the centriole, and a radial arrangement of the mitochondria about this centriole and centrosphere. In this paper another type of degeneration is described in detail, in which the striking characteristic is a great enlargement of the centrosphere, with a sharp border, centriole and differentiation into a medullary and vertical zone, and only slight vacuolation about the centrosphere. This centrosphere is apparent, a semi-solid gel, into which the granules cannot penetrate, while in the surrounding semifluid cytoplasm the granules and vacuoles move about freely. These enlarged centrospheres are identical with the cytoplasmic inclusions seen in cancer cells, the "cancer parasites" of Plimmer. The writer notes that the enlargement of the centrosphere occurring in the degeneration of embryonic cells suggests that the appearance of similar centrospheres in cancer is an indication that cancer cells are likewise embryonic in character and might be used to support the theory that cancers arise from embryonic rests.—W. P. B.

1405. *The Formation of Vacuoles Due to Bacillus typhosus in the Cells of Tissue Cultures of the Intestine of the Chicken Embryo.* M. R. LEWIS. J. Exper. M., N. Y., 1920, 31, 293-311.

Pieces of intestine of 7-9 day chick embryos, growing in Lewis-Locke solution by the hanging drop method were inoculated with fresh cultures of *B. typhosus*, with the result that 10-12

hours after inoculation extensive vacuolation appeared, the vacuoles increasing in size, fusing, and collecting about a central mass of cytoplasm, the centrosphere. It was noted that the cells of the connective tissue, the endodermal membrane, the mesothelium and the clasmato-cytes ingested *B. typhosus* in these cultures. Egg albumin, blood serum, dextrose, glycogen, aleuronat, phosphorus, carbon dioxide, urea and ammonia failed to cause vacuolation.—W. P. B.

1406. *Effect of Feeding the Pineal Body upon the Development of the Albino Rat.* W. R. Sisson AND J. M. T. FINNEY, JR. J. Exper. M., N. Y., 1920, 31, 335.

The pineal body of young calves was fed to albino rats beginning at the age of 3 weeks and extending over periods from 3 to 6 weeks. Four litters of rats were used. Of these, 14 rats were fed the pineal powder and 10 were used as controls. Observations in regard to developmental changes and microscopic examination of the endocrine glands and reproductive organs were made. The pineal-fed rats of the first two litters remained somewhat smaller than their controls. The pineal-fed and control animals of litters 3 and 4 showed no differences in development. Microscopic studies showed no differences between pineal-fed and control rats.

It was therefore concluded that feeding the desiccated pineal body of young calves to young albino rats fails to produce any effect upon the early development of these animals.—W. P. B.

1407. *Zur Wirkung fermentativ gewonnenner Spaltungsprodukte auf Karzinome. (The Action of Split Products Obtained by Digestion upon Carcinoma.)* G. SCHERBER. Wien. klin. Wehnschr., 1920, 33, 654.

Products split off from carcinoma by digestion (cf. Joannovic's article) were injected into 9 patients with epithelioma. The results with intravenous inoculation were no better than those following subcutaneous introduction. Only a few of the patients, namely those with superficial carcinomata, showed any improvement. The author regards the method as still in the experimental stage, and advises operation wherever this is possible.—W. H. W.

1408. *Zur Wirkung fermentativ gewonnener Spaltungsprodukte aus Geweben und Bakterien. (The Action of Split Products Obtained by Digestion of Tissues and Bacteria.)* G. JOANNOVICS. Wien. klin. Wehnschr., 1920, 33, 649.

Products of an unknown nature were split off from human tumors by digestion, sterilized, and injected into patients. There followed a connective tissue proliferation about and within the neoplasm, and degeneration of some of its cells in consequence of this fibrosis. The smaller the tumor and the better the condition of the patient, the more distinct was the reaction. The products in question will stand several 15 minute exposures to 100°C., but will not pass a Reichel filter.—W. H. W.

1409. *The Comparative Oxygen Avidity of Normal and Malignant Cells Measured by their Reducing Powers on Methylene-blue.* A. H. DREW. Brit. J. Exper. Pathol., 1920, 1, 115.

The following abstract of his article is furnished by the author:

"In the case of normal tissues decolorisation of the blue starts at once, but with tumours there is an initial lag during which no decolorisation takes place, and even then it is never so extensive as with normal tissues. Decolorisation is dependent upon the integrity of the cell, being absent when the tissue is ground up. If normal tissue is treated with a soluble calcium salt it behaves like tumour tissue, but is re-converted to the normal by the action of sodium salts. The lag of tumour tissue can be abolished by washing out the dissolved oxygen from the solutions, this being sufficient to supply requirements without attacking the blue."—W. H. W.

1410. *Placenta Implants.* G. ROMANO. Riforma med., 1920, 36, 324. (Abs. J. Am. M. Ass., 1920, 74, 1747.)

In rats implanted intraperitoneally with a suspension of mashed placenta, the tissue grew in all cases (10) in the lungs, replacing the parenchyma of these organs and finally causing death by suffocation.—W. H. W.

## DISEASES OF THE BLOOD, LYMPHATICS AND DUCTLESS GLANDS

(See also Number 1510)

1411. *Die akuten Entzündungen des Kropfes; Aetiologie, Verlauf und chirurgische Behandlung. (Etiology, Course, and Surgical Treatment of acute Infections of the Thyroid.)* HEINRICH KLOSE. Berl. klin. Wehnschr., 1920, 57, 202-204.

Acute infections of the thyroid seem to be confined to those in whom the gland has undergone focal alteration because of specific pathological processes. The common goiterous thyroid furnishes an excellent breeding ground for invading bacteria. Prognosis depends upon an early diagnosis of the condition. Radical surgical intervention with removal of the infected areas is the most satisfactory treatment.—B. C.

## DISEASES OF THE DIGESTIVE SYSTEM

(See also Numbers 1354, 1369, 1426, 1459, 1503, 1509, 1512, 1523)

1412. *Presidential Address, Indian Science Congress, Bombay, 1919.* LEONARD ROGERS. Indian J. M. Research, Calcutta, 1919, Special Indian Science Congress Number, 1-17.

A review of the researches leading up to the present method of treating cholera with hypertonic salines, permanganates and alkalies which has reduced the mortality rate to less than 20 per cent.—A. L. W.

1413. *Ueber die Choleraepidemie in Corfu. (The Cholera Epidemic in Corfu.)* A. E. TSAKALOTOS. Schweiz. med. Wehnschr., 1920, 50, 230-232.

Bacteriologic proof of cholera infection was found in 89 cases. Of these cases 57 were fatal. During the period of epidemic cholera other enteric diseases—typhoid, paratyphoid, and dysentery—were also prevalent. Three cases of mixed infection were discovered: *V. cholerae* and *B. dysenteriae* Flexner. The source of the infection was apparently uncooked vegetable salads. Prophylactic vaccination was employed.—G. H. S.

1414. *Zur Entstehung des erworbenen hämolytischen Iktus. (The Origin of Acquired Hemolytic Jaundice.)* CARL LEWIN. Deutsche med. Wehnschr., Berl. & Leipz., 1920, 46, 228-232.

On the basis of the findings in 2 cases of hemolytic jaundice occurring in paratyphoid B and dysentery infections respectively, it is concluded that this disease is most probably of enterogenic origin. Disease of the bile ducts as the primary cause seems in these cases to have been excluded.—B. C.

## DISEASES OF THE GENITO-URINARY SYSTEM

(See also Numbers 1261, 1389, 1497, 1504, 1521, 1524)

1415. *Studies of the Prenatal Transmission of Syphilis.—1. Syphilis of the Testicle.* L. HERMAN AND J. V. KLAUDER. Am. J. M. Sc., Phila., 1920, 159, 705-722.

The authors direct attention to the importance of the testicle in syphilitic involvement of the body. They feel that the infected testicle bears an intimate relationship to the transmission of the disease to the spouse and progeny of the individual. In support of this view, experimental evidence from various investigators is quoted. The pathology of the condition is fully considered, also the clinical aspects of syphilis of the testes are discussed with a report of a number of cases. Syphilitic epididymitis in relation to syphilitic orchitis is dealt upon in the paper.—L. W. F.

1416. *The Bacteriology of the Urine in Renal Tuberculosis.* J. DELLINGER BARNEY AND EDWARD S. WELLES. J. Am. M. Ass., Chicago, 1920, 74, 1499.

Smears from the sediment of urine were found to be more reliable than cultures. Cultures and smears gave positive results from the bladder urine in 55.3 per cent and from the kidney urine in 28.6 per cent of cases. Positive results were obtained from the sound kidney more frequently than from its tuberculous mate. The high acidity of tuberculous urine may account for its relative freedom from tubercle bacilli.—P. G. H.

1417. *The Diagnosis of Chancroid and the Effects upon its Incidence in the American Expeditionary Forces of Prophylaxis.* J. E. MOORE. J. Urology, Balt., 1920, 4, 169-177.

During a selected period of 10 months' service in a genito-urinary clinic of the American Expeditionary Forces at Paris, 693 venereal ulcers were seen and the initial diagnosis made of primary syphilis in 54.5 per cent and of chancroid in 45.5 per cent. Based upon a study of 135 of the latter, who were followed 8 to 12 weeks, the author concludes that the history of incubation, clinical appearance of sore, and presence of Ducrey bacillus are merely suggestive in ruling out syphilis. He relies more upon repeated dark field examinations and weekly Wassermann tests for a period of 2 to 3 months which changed the diagnosis to syphilis in 14.8 per cent of those under observation. Smears were positive in only 25 per cent and cultures 10 of clinical chancroids examined.

He believes calomel ointment to be of little value in its prevention as statistically shown by the distinctly greater number of chancroidal cases giving a history of prophylaxis, 58.5 per cent in contrast to 41.7 per cent of the venereal group as a whole. Experimental observations on 5 cases are given upon the comparative effect of calomel ointment and tincture of green soap applied at intervals from 10 minutes to 2 hours to chancroidal pus inoculations on the arm. The areas treated with green soap were negative while typical lesions developed in every instance where calomel was applied and in the untreated controls.—R. D. H.

1418. *The Antiseptic Properties of Normal Dog Urine as Influenced by Diet.* R. F. HAIN. J. Urology, Balt., 1920, 4, 177-184.

Experiments were made to determine the influence of diet upon the bactericidal properties of drug-free dog urine.



The author concludes that with a given diet high in protein, the germicidal properties of dog urine is inversely proportional to the quantity of fluid intake; also with a constant low fluid allowance the bactericidal properties are greater in direct proportion to the increasing ingestion of protein food, being more marked toward *B. coli* than *Staphylococcus albus*, while dogs fed on bread and milk have no germicidal properties for either organism. Similarly the accidental contamination of catheterized specimens were more frequent in the urines from dogs on bread and milk diet.—R. D. H.

1419. *Über die "interstitielle Nephritis," ihre Bedeutung bei der Scharlacherkrankung ("Scharlachnephritis") und ihr Vorkommen bei hamorrhagischen Pocken. (Interstitial Nephritis, its Significance in Scarlet Fever, and its Occurrence in Hemorrhagic Smallpox.)* F. MUNK. Virchow's Archiv. f. path. Anat. (etc.), Berl., 1920, 227, 210.

In numerous cases of scarlet fever in children, Munk found interstitial infiltration in the early stages of the disease in various organs, particularly in the kidneys and suprarenal capsules. In adults he found nephritis in a small per cent of the cases. He also describes interstitial nephritis in a case of hemorrhagic smallpox. In both instances, he claims, the cause is the specific virus.—S. A. G.

1420. *Über Nierenschädigungen bei experimenteller Streptokokkenkrankung der Maus in ihrer Beziehung zu den Befunden und Problemen der menschlichen Nephritis. (Kidney Injuries in Experimental Streptococcal Disease of the Mouse in its Relation to the Findings and Problems of Human Nephritis.)* M. H. KUCZYNSKI. Virchow's Archiv. f. path. Anat. (etc.), 1920, 227, 186.

In 48 per cent of influenza cases were found changes in the kidneys leading to glomerulonephritis, due to secondary invasion of streptococci and pneumococci. In the experimental animals kidney lesions were produced similar to those found in man. There is a swelling of glomerular endothelial cells, local anemia followed by necrosis, proliferation of the cells and hyaline degeneration. In functional disturbances they also correspond to human nephritis.—S. A. G.

#### DISEASES OF THE NERVOUS SYSTEM

(See also Numbers, 1446, 1448, 1511, 1514, 1515, 1516, 1517, 1518, 1522)

1421. *Observations on the Colloidal Gold Reaction with Cerebrospinal Fluid.* E. KELLERT. Am. J. M. Sc., Phila., 1920, 159, 257-263.

The colloidal gold test on cerebrospinal fluid is proving of some practical value as a diagnostic procedure. Time may be saved over other methods of diagnosis and often information is gained in this way where other means have failed. Its value is shown in those cases of meningitis where the Wassermann reaction is negative, but a characteristic colloidal gold curve is obtained; a tuberculous curve is obtained but no acid-fast bacilli are found; as a differential diagnosis between poliomyelitis and tuberculous meningitis. However, occasional false reactions are obtained, a point which the author considers in this paper. In discussing the different colloidal gold solutions, he observes that the opalescent fluids yield a more marked curve than others, while those having a clear red appearance and no trace of opalescence may yield but slight and inconclusive reactions. It is advisable to check the accuracy of new lots of colloidal gold by using as control spinal fluid from human cases. Apparently no correlation exists between the degree of the curve and the extent of pathological involvement, although an exceedingly pronounced curve is obtained with spinal fluid from patients suffering from tuberculous meningitis several days before death. These fluids show greatly increased cell counts and positive globulin reaction. A parallelism appeared to exist between the amount of globulin present and the extent of the curve. Only three (one syphilis, one poliomyelitis, and one tuberculous meningitis) fluids showed a positive globulin test and increased cell count in a series of 75 fluids giving negative colloidal gold reactions. Blood in greater or less quantity will give a positive globulin test but a negative colloidal gold curve. It may be necessary to centrifuge the specimen and examine microscopically to detect the blood. In a series of 75 negative fluids three gave positive Wassermann reactions; two others gave negative Wassermann tests although the blood gave positive Wassermann reaction. The colloidal gold reaction failed to react in 7 per cent of positive cases.

Study of the results obtained in syphilis would indicate that while the method was more sensitive than the Wassermann test, the possibility of error is greater in absence of other confirmatory tests. Out of 122 luetic curves, 95 gave changes that could be regarded positive or highly suggestive of syphilis. Positive Wassermann reactions occurred with 70 per cent of these, while 24 per cent could be excluded as probably not syphilitic, but 6 per cent were clinically syphilis, with positive colloidal gold curve and negative Wassermann reaction.

Positive colloidal gold curves were obtained in 40 cerebrospinal fluids with tentative clinical diagnosis of tuberculous meningitis. Subsequently 7 of these were excluded as not tuberculous meningitis. Tuberculous meningitis was corroborated by other tests in 33 cases. Of these 4 gave curves suggesting acute meningitis—they were terminal cases. The reaction was correct in 88 per cent, and misleading in 12 per cent of the cases.

Examination of cerebrospinal fluids from 27 cases of acute meningitis gave curves suggesting acute meningitis in only 20 or 74 per cent positive, while 26 per cent were negative or inconclusive. Organisms were demonstrated in all except one.

The author reports a number of cases, illustrating certain errors, etc., in diagnosis by the colloidal gold curve results. Attention is drawn to the fact that cerebrospinal fluids when contaminated with blood yield curves in the luetic zone. Tests were done upon human serum in varying dilution with colloidal gold which yielded typical curves in the luetic zone in a 1 to 1000 dilution. In very low dilutions, the human serum gave curves in the terminal or acute meningitic zone. More pronounced curves are obtained with diluted luetic human serum than the non-luetic serum. Inactivation does not greatly alter the results.

The author draws the following conclusions from his studies:

- "1. The colloidal gold reaction is useful as an additional or confirmatory test.
- "2. It is of greatest value in the syphilitic diseases of the central nervous system, especially tabes and paresis.
- "3. The test may serve to differentiate between tuberculous and other forms of meningitis.
- "4. The reaction is correct in approximately 80 per cent of cases.
- "5. Cerebrospinal fluid contaminated with blood in small quantity frequently gives reactions in the luetic zone.
- "6. Positive results unconfirmed by other tests are of only slight value.
- "7. The Wassermann reaction and the cytological examination of the cerebrospinal fluid are of greater value than the colloidal gold test."—L. W. F.

1422. *Meningococcus Meningitis at Camp Lee*. R. L. HADEN. Arch. Int. Med., Chicago, 1919, 24, 514-519.

A generalised infection was present in 21 out of a series of 31 cases. The mortality among those treated with serum intraspinally was 37.5 per cent. Among those receiving both intraspinal and intravenous treatment, the mortality was 6.6 per cent.—G. H. R.

## DISEASES OF THE RESPIRATORY SYSTEM

(except Influenza and Tuberculosis)

(See also Numbers 1493, 1501, 1519, 1580)

1423. *Multiple Brain Abscesses Secondary to Bronchiectasis and Kyphoscoliosis*. CLARENCE C. SÆLHOF. J. Nerv. & Ment. Dis., N. Y., 1920, 51, 330-339.

A report of a case of multiple bilateral brain abscesses secondary to a bronchiectasis resulting from the wedging of the lower lobe of the right lung into a pocket caused by kyphoscoliosis. From both the abscesses and the involved lung *B. fusiformis* and anaerobic streptococci were isolated.—F. W. H.

1424. *Chronic Non-Tuberculous Lung Infections*. C. G. FIELD. Am. J. M. Sc., Phila., 1920, 159, 442-449.

The author considers certain chronic infections of the lungs which closely resemble tuberculosis and are frequently erroneously diagnosed as such. Particular attention is directed toward the diagnosis and treatment of the condition. A series of 8 cases is reported, and the findings are discussed in conjunction with the reports of other writers upon the subject.

Among the etiological factors considered, it is noted that the onset may occur at any age, but somewhat more frequently in children; 3 of the author's cases began before the age of six, 2 at thirteen, and 3 at twenty years. It is more common among females, although equally divided among the sexes in the cases reported. Usually it follows acute diseases, affecting particularly the upper respiratory tract. The onset and exacerbations occur more frequently during the colder months. Adenoids and nasal deformities which cause mouth-breathing are important etiological factors. Chronic sinusitis is commonly associated with the condition. Family incidence may occur. Chest deformity also may be a factor. The bacteriological findings may include any of the common invaders of the respiratory tract, although the influenza bacillus most frequently predominates in the sputum. In the author's series of 8, it predominated in only one instance. *Streptococcus pyogenes* was predominant in 3 and *Staphylococcus albus* in 4.

Not many cases have come to autopsy owing to the benign nature of the disease—none in the author's series. But evidence from other sources would indicate localised bronchitis, infiltration of bronchial wall, bronchopneumonia foci about smaller bronchi in the earlier stages of the disease, later showing bronchiectasis, interstitial pneumonia, or increased tendency to fibrosis, are the pathological findings.

The symptoms and course of the condition, the physical signs and the diagnosis are discussed. As to treatment, the author holds that the essential treatment is posture as pointed out by Garvin, Lyall and Morita. In some cases "pulmonary gymnastics" may benefit. Change to warmer climate, outdoor life, etc., may help some of the chronic cases that are refractory to treatment. An autogenous vaccine was used in two of the author's cases, but he "noticed no more improvement than in similar cases which were receiving only postural treatment."—L. W. F.

1425. *Pneumonie et tuberculose chez les troupes noires (Pneumonia and Tuberculosis among Black Troops.)* A. BORREL. Ann. de l'Inst. Pasteur, Par., 1920, 24, 105-148.

Senegalese troops in France were highly susceptible to tuberculosis. In this paper, provisions are outlined for tuberculous prophylaxis in battalions of negro troops; and the precautions to be observed in the sanitary care of tuberculous negro troops on their return to their native country are formulated.

These troops were also susceptible to pneumonia. Some good results were obtained by the use of pneumococcus vaccine, but the statistics of the camps and the effects of the vaccine are not sufficiently clear for conclusions to be drawn.—S. B-J.

1426. *Pulmonary Complications of Paratyphoid Fever, with a Report of Four Cases.* T. KLEIN AND R. G. TORREY. Am. J. M. Sc., Phila., 1920, 159, 548-555.

In a series of 6 cases of paratyphoid fever, 4 showed severe pulmonary disturbances during the course of the attack. The first case was a young adult male admitted with a frank lobar pneumonia. The fever still persisted after his lungs had entirely cleared and an otherwise complete symptomatic recovery. Blood cultures were negative; the patient did not appear septic. Later the patient had hemorrhage from the bowels. Widal reactions for *B. typhosus* and *B. paratyphosus* A were negative, but a strongly positive reaction occurred with *B. paratyphosus* B. These results were confirmed by second tests. *B. paratyphosus* B was subsequently isolated from the stool. The patient made an uneventful recovery. Since the first case the authors have observed 3 additional cases showing pulmonary complications occurring among 5 cases studied. Two of these cases suffering from *B. paratyphosus* B infections showed evidences of bronchopneumonia; one had a lobar distribution, while the other showed involvement of both lungs. The first showed positive blood cultures, but the sputum was not cultured for *B. paratyphosus* B. The patient's fever lasted 9 days, followed by recovery. The other case ran a longer course, showing a very severe bilateral bronchopneumonia, among other symptoms of his infection. The blood cultures were positive for *B. paratyphosus* B. On admission he also was suffering from a bilateral chronic purulent otitis media, which was treated by frequent irrigations daily. Cultures made from pus from the otitis media 62 days after admission of the patient, showed *B. paratyphosus* B, likewise material taken from around the teeth gave the same result. The fourth case was also a young man who showed on admission typhoid symptoms, but gave a negative Widal reaction against *B. typhosus*. Four days after admission he began to cough up a very tenacious blood-streaked sputum. Widal reactions against *B. paratyphosus* A were strongly positive on that day. Blood culture was positive for *B. paratyphosus* A, and the same organism was isolated from the sputum. The patient's serum agglutinated the organism isolated from the sputum. The bronchopneumonia was confined to the right lower lobe, and was of short duration. The patient developed a series of small abscesses, but on culturing the pus, it was impossible to isolate the bacillus.

The authors conclude that a definite pulmonary form of paratyphoid fever exists which might easily be confused with the acute respiratory infections. They also direct attention to the possibilities of the sputum becoming a means of spreading the disease, or the patient becoming a "chronic carrier." The literature on the subject is well reviewed, and data are submitted in the discussion of the condition.—L. W. F.

1427. *A Group of Sixty-eight Cases of Type I Pneumonia Occurring in Thirty Days at Camp Upton, with a special Reference to Serum Treatment.* C. F. TENNEY AND W. T. RIVENBURGH. Arch. Int. Med., Chicago, 1919, 24, 545-552.

The mortality among these cases was 14.7 per cent.—G. H. R.

1428. *Pathology and Bacteriology of Pneumonia.* BALDWIN LUCKE. Penn. M. J., 1920, 23, 369-371.

The pathology of measles and influenzal bronchopneumonia is described. The author concludes that *B. influenzae* and possibly the non-hemolytic streptococcus are the cause of the catarrhal forms of bronchopneumonia. Fibrinocatarrhal bronchopneumonia is caused by the pneumococcus and nonhemolytic streptococcus, while in fibrinopurulent and purulent types, staphylococcus, pneumococcus and hemolytic streptococcus are the chief invasive factors.—C. P. B.

## INFLUENZA

(See also Numbers 1327, 1355, 1425, 1469, 1472, 1474)

1429. *Significance of the Different Types of Pneumonia Following Influenza: A Therapeutic Indication.* B. S. KLINE. J. Am. M. Ass., Chicago, 1920, 74, 1312.

The author adduces evidence for the belief that in pneumonia following influenza, an associated pulmonary edema is a factor of importance in determining the rapid extension of the inflammation throughout the lung and that in absence of this edema, the lesion remains localized about the bronchial branches.—P. G. H.

1430. *Experimental Study of the Nasopharyngeal Secretions from Influenza Patients: Preliminary Report.* PETER K. OLITSKY AND FREDERICK L. GATES. J. Am. M. Ass., Chicago, 1920, 74, 1497.

The authors obtained a specific substance from the nasopharyngeal section in cases of uncomplicated influenza. This substance seemed to be present only in the early hours of the disease, not later than 36 hours. It has not been found in cases of secondary pneumonia nor in secretions from persons free from the syndrome of influenza. Clinical and pathological conditions were produced in rabbits with this substance and carried through 15 successive animals. The active substance is filterable and resists sterile 50 per cent glycerin solution for 9 months, but probably no longer. The authors think that the pneumococcus, Pfeiffer's bacillus, *Streptococcus viridans* and other organisms when encountered in the disease are secondary invaders.—P. G. H.

1431. *L'immunité acquise au cours des épidémies récentes de grippe. (The Immunity Acquired during the Course of the recent Epidemic of Influenza.)* M. CHAUFFARD. Bull. Acad. de méd., Par., 1920, 83, 394-397.

The author states that his observations are too few to permit him to draw conclusions but he is of the opinion that there is some immunity.—G. H. R.

1432. *The Relationship of B. influenzae to Clinical Influenza.* F. M. HUNTOON AND S. HANNUM. Proc. N. Y. Path. Soc., 1919, 19, 22-28.

Experimental studies were carried out to determine the relationship of *B. influenzae* to certain conditions occurring in clinical influenza. Since a soluble toxin was not demonstrable in their first studies they considered the question of an endotoxin. For this purpose, 10 strains of *B. influenzae* were grown, dried *in vacuo*, ground up with salt and extracted. Tests of the toxic power of this extract in varying amounts were carried out upon a series of white mice by intraperitoneal injections. To determine specificity tests with an immune serum (horse immunized against living cultures of the same 10 strains) were made upon mice. When the serum and extract were left in contact at room temperature 30 minutes before injection the serum protected against at least 10 M. L. D. By symbiotic growth of *B. influenzae* and *Streptococcus hemolyticus* in broth, a similar toxin was produced against which the same immune serum proved to protect. The streptococcus grown alone produced a toxic product which was not neutralized by the immune serum used. It is thought that in symbiosis the streptococcus disintegrated the influenza bacillus. The animals which were killed by the bacillary extract showed uniformly "an acute congestion of the lungs with occasional hemorrhages into the alveoli and into the pleura."

During the progress of their work Parker's article appeared reporting the production of a soluble toxic product in broth cultures of *B. influenzae*. They repeated that work, with confirmatory results, and found that the soluble toxin was somewhat similar to the salt extract endotoxin product, and that the two substances cross immunized. By agglutination tests and absorption of agglutinins they "have found that the polyvalent horse serum and monovalent rabbit and guinea pig sera show cross relationship between the various strains of influenza bacillus studied, even the strains isolated from sporadic cases before the start of the present epidemic."

Sublethal doses of the influenza bacillus or its products injected into animals predisposed these animals to lung infections with other organisms, spontaneously or artificially when introduced into pharynx or into other part of the body. They state "that there is nothing in the serological evidence to preclude the consideration of this organism [*B. influenzae*] in its influence as an important factor in the disease known as clinical influenza."—L. W. F.

1433. *Influenza and Tuberculosis. A supplementary report and critical review.* J. BURNS ANDERSON, JR., AND ANDREW PETERS, JR. Am. Rev. Tuberc., Balt., 1920, 4, 71-83.

This is a supplement to a former report on influenza among the patients at Loomis Sanatorium. The authors conclude that sufficient evidence has not been produced to show that tuberculous individuals possess an immunity to influenza not possessed by the non-tuberculous, nor is the severity of attack of influenza less among the tuberculous. On the contrary statistics indicate that the case fatality was higher among the tuberculous than among the general population. Often a case of influenza marks the inception of definite pulmonary tuberculosis, which may be rapid and immediate or insidious and remote. Among those already tuberculous, influenza may sometimes, to a varying degree, reactivate quiescent lesions.—T. G. H.

1434. *Influenza at the Hospital for the Insane. London.* 7th Annual Rep., Inst. Pub. Health, Lond., Canada.

An intensive laboratory study of 163 cases of influenza was made. *B. influenzae* bore no etiological relationship to the outbreak. Pyogenic organisms played a secondary rôle. Vaccine therapy was of questionable value as an ameliorative of infection.—C. M. H.

1435. *Therapeutic Measures in Influenza.* G. E. BEAUMONT. Practitioner, Lond., 1920, 104, 263-277.

Drugs and vaccine were used. Treatment must be symptomatic as no one line of treatment appeared better than another.—C. P. B.

1436. *Das mediastinale Emphysem. (Mediastinal Emphysema.)* SIGMUND WASSERMANN. Wien. klin. Wchnschr., 1920, 33, 122-127.

There occurs frequently in epidemic influenza-pneumonia a diffuse mediastinal emphysema which is considered quite characteristic as a clinical sign.—B. C.

1437. *Zur Behandlung der Grippe. (Treatment of Influenza.)* F. KRAUS. Deutsche med. Wchnschr., Berl. & Leipz., 1920, 46, 225.

Pandemic influenza should be distinguished from the endemic or sporadic type since the symptoms and course of these diseases are not alike. Treatment consists of the administration of eucupin and influenza serum. Where pneumonia complicates the picture, intravenous injection of argoflavin or electrocollargol is suggested. The absolute efficacy of these measures is not yet known, but symptomatic treatment alone is not the most satisfying procedure in these cases.—B. C.

1438. *Kritik der Lauterburg'schen Kritik der Gripeschutzmasken. (Criticism of Lauterburg's Criticism of Protective Masks in Influenza.)* ARNOLD JOSEFSON. Schweiz. med. Wchnschr., 1920, 50, 395. *Erwiderung auf die Kritik meiner Arbeit "Untersuchungen über die Bakteriendichtigkeit der Gripeschutzmasken" im Corr. bl. f. Schweiz. Aerzte, Nr. 47, 1919. (Reply to the Criticism of my Paper "Investigation on the Penetration of Protective Masks by Bacteria.)* LAUTERBURG. Schweiz. med. Wchnschr., 1920, 50, 395-397. Polemical.—G. H. S.

1439. *Acetonuria nell'influenza. (Acetonuria in Influenza.)* M. ASCOLI. Policlin., Roma, 1920, 27, 453-454.

In a large majority of cases of influenza, acetone and diacetic acid were present in the urine.—P. M.

#### ENCEPHALITIS LETHARGICA

1440. *The Diagnosis of Epidemic Encephalitis.* LEO LOEWE AND ISRAEL STRAUSS. J. Am. M. Ass., Chicago, 1920, 74, 1373.

The authors found that in 78 per cent of cases examined Berkefeld filtrates of nasopharyngeal washings produced characteristic lesions when injected intracranially into rabbits. A filterable organism was found in 64 per cent of the cases. Cerebrospinal fluid of patients inoculated into rabbits produced the disease in 75 per cent of the cases. Positive cultures were obtained in 50 per cent of cases. The disease is sharply differentiated from poliomyelitis.—P. G. H.

1441. *L'Encéphalite léthargique. (Lethargic Encephalitis.)* ARNOLD NETTER. Presse méd., Par., 1920, 28, 193.

A conference of French and German physicians of the Saar Region. Netter discusses the clinical features; gives the mortality at 20-25 per cent. The diagnostic value of examination of the cerebro-spinal fluid is emphasized, particularly for its sugar content, which averaged, in six cases, 86 mgm. per 100 cc. The disease is characterized as a specific virulent infection, whose cause manifests an elective affinity for certain regions of the mesencephalon. It is not to be confused with spironemal sleeping sickness, with poliomyelitis (differences in epidemiology, severity and permanent sequelae), nor with influenza.

The disease is traced back to Galen, so far as sporadic cases are concerned. It is more common at certain periods under the effect of non-specific ("cosmic") factors which increase the virulence of the etiological agent. These factors are, similarly to those which favor the epidemicity of influenza, especially prominent in winter. Evidence of contact infection is scanty but isolation is justified. A similarity to poliomyelitis, rabies and mumps, so far as etiology is concerned, is advanced. Netter believes that the cause will prove a filterable virus (Strauss, Loewe).

Urotropin, pilocarpin (to stimulate the elimination of the virus from the parotid gland: [No proof of its presence is presented save the analogy to rabies]) and injection of terebrinth, to produce abscesses of fixation, are recommended. Arsenicals are not favored.—L. A. K.

1442. *Influence de la grossesse sur l'évolution de la tuberculose pulmonaire et pleurale. L'anergie tuberculinique au cours de la grossesse. Allaitement et tuberculose. (The Influence of Pregnancy on the Development of Pulmonary and Pleural Tuberculosis. Tuberculin Hypersensitiveness in the Course of Pregnancy. Lactation and Tuberculosis.)* P. NOBECOURT AND JEAN PARAF. Presse méd., Par., 1920, 28, 133.

Twenty-three cases of labor in women with pulmonary or pleural tuberculosis are described. In 4 cases of fibrous lesions, no exacerbation followed delivery. Among 11 women with ulcero-caseous lesions, there were 9 deaths. In 8 cases of pleuro-pulmonary or pleuritic types, all showed evidence of exacerbation, but 7 were discharged apyretic.

One hundred tuberculous women of whom many presented no active symptoms were tested by the cuti-reaction. In the course of pregnancy, 15 per cent showed a loss or diminution of reaction. This is interpreted as diminished immunity.

The question of the effect of nursing on the mother depends largely on the case; in cases of healed lesions (fibrous), nursing may appear beneficial; it is contraindicated in more active cases.—L. A. K.

1443. *L'Encephalite myoclonique. (Musculo-Clonic Encephalitis.)* J. A. SICARD. Presse méd., Par., 1920, 28, 213.

A description of a new (?) disease characterized by clonic muscular spasm. The possibility of its relation to encephalitis lethargica is considered.—L. A. K.

1444. *On the Epidemic Acute and Subacute Non-Suppurative Inflammations of the Nervous System Prevalent in the United States in 1918-1919: Encephalitis; Encephalomyelitis; Polyneuritis; and Meningo-Encephalo-Myeloneuritis.* L. F. BARKER, E. S. CROSS AND S. V. IRWIN. Am. J. M. Sc., Phila., 1920, 159, 157-193, 337-353.

The authors in an extensive study of an epidemic disease of an inflammatory nature involving the nervous system (in particular the brain (encephalitis), sometimes the spinal cord (myelitis), or both (encephalomyelitis), the meninges and peripheral nerves (meningo-encephalo-myelo-neuritis) report a series of cases which are fully analysed and discussed. The clinical phenomena are summarized, including onset, general symptoms, focal symptoms, meningeal symptoms, with a study of the cerebrospinal fluid, the blood, and the urine. The duration of the disease and prognosis, as well as the treatment are considered. Of special interest is the discussion upon the nature of the disease, and its etiology. It was soon recognized as an infectious or toxi-infectious process involving the cerebrospinal nervous system. Probably its epidemic nature had been recorded as early as 1718. At present the problem of etiology "resolves itself into three questions: (1) Is the disease due to the virus that causes influenza? (2) Is the disease due to the virus that causes the Heine-Medin disease or to a modification of that virus? and (3) Is the disease due to a virus *sui generis*?" As concerns the first question, certain facts may be used to support this supposition, while others are in opposition. But since even the precise nature of the influenza virus is much in debate, the questions of relationship between the two diseases must be left open until further knowledge is gained. Whether the virus of epidemic encephalitis is identical with, or a slight modification of, the virus (*Flexneria noguchii*) causing acute anterior poliomyelitis, is hardly supported by the clinical nature of the two diseases, blood findings, age incidence, distribution of epidemic, etc. From the evidence now available, such a virus is not much more than an interesting speculation. Some hold that the "causative agent is neither identical with nor even a modification of any other virus." If this is the case the findings of both Wiesener and of Wilson may prove to be of extreme importance, although some other filterable or unfilterable virus may be shown eventually as the true etiological factor. The authors give numerous references to the important literature on the subject.—L. W. F.

1445. *Contagiosité de l'encéphalite léthargique. (The Question of Contagion of Lethargic Encephalitis.)* A. NETTER. Bull. Acad. de méd., Par., 1920, 83, 373-384.

From a study of a number of cases the author believes that lethargic encephalitis is truly contagious and that the virus is spread by means of the saliva of infected individuals. A person may be capable of infecting others over a long period of time.—G. H. R.

1446. *Recherches expérimentales sur le virus de l'encéphalite léthargique (Encéphalite épidémique). (Researches on the Virus of Lethargic Encephalitis.)* C. LEVADITI AND P. HARTVIER. Bull. Acad. de méd., Par., 1920, 83, 365-367.

An emulsion of the brain tissue of a person dead from lethargic encephalitis on the ninth day of the disease was injected intracerebrally into two rabbits and one monkey. One of the rabbits died on the eighth day after inoculation. The brain tissue and heart blood of this animal were bacteriologically sterile and the same pathologic changes were observed as in the human brain. An emulsion of the brain of this rabbit was injected similarly into two other rabbits. These animals died on the sixth and seventh days with characteristic lesions.

Further experiments lead the authors to the following conclusions: (1) The incubation period for intracerebral inoculation is at least 4 or 5 days; (2) the virus can be preserved in glycerin; (3) the virus of encephalitis is filterable; (4) the virus can be inoculated through the peripheral nerves or through the anterior chamber of the eye; (5) the virus is pathogenic for rabbits but not for monkeys; (6) after several passages through rabbits the virus becomes pathogenic for guinea pigs; (7) the virus is preserved by drying *in vacuo*, over sulphuric acid or over potassium hydroxide; (8) the virus can be found in the medulla of inoculated animals; (9) the serum of convalescents does not neutralize the virus.—G. H. R.

1447. *Encephalitis Lethargica.* A. HOWELL. Practitioner, Lond., 1920, 104, 290-298.

Clinical and differential diagnosis.—C. P. B.

1448. *Ueber Encephalitis lethargica und ihr Auftreten in Zürich im Januar/Februar 1920. (Encephalitis lethargica and Its Appearance in Zurich in January and February, 1920.)*

HANS W. MAIER. Schweiz. med. Wchnschr., 1920, 50, 221-225; 249-254.

A study of 31 cases. Nine of the cases were fatal. Nothing is given with regard to etiology, although it is stated that the disease appears to have no connection with influenza or post-influenzal conditions.—G. H. S.

1449. *Grippe-Encephalitis und Encephalitis lethargica.* (*Influenzal Encephalitis and Encephalitis lethargica.*) FRANZ HÖGLEK. Wien, klin. Wchnschr., 1920, 33, 144-147.

Influenzal encephalitis is characterized by the severe general cerebral symptoms (stupefaction of all grades to complete unconsciousness) which have an acute onset during a grip epidemic. On the other hand, in encephalitis lethargica, the general cerebral symptoms are very slight, the most striking feature being somnolence without stupefaction. This is also accompanied by an involvement of the eye muscles.—B. C.

## TUBERCULOSIS

(See also Numbers 1844, 1320, 1387, 1388, 1416, 1433, 1470, 1473, 1489, 1506)

1450. *Sodium Morrhuate in the Treatment of Tuberculosis.* LEONARD ROGERS. Indian J. M. Research, Calcutta, 1919, Special Indian Science Congress Number, 236-256.

The originator of the use of sodium salts of unsaturated fatty acids in the treatment of leprosy, tuberculosis and other diseases caused by acid-fast organisms, here recounts his first experiences with the use of sodium morrhuate in tuberculosis. The method of manufacture and mode of administration of this salt are described. Case reports made by several different physicians in India who used this treatment are appended. All observers who used the sodium morrhuate are impressed by its value in tuberculosis. It was given either subcutaneously, intramuscularly or intravenously as a 3 per cent aqueous solution and in amounts varying from 0.5 to 2 cc.—A. L. W.

1451. *Incidence of Tuberculosis in Husband and Wife.* ARNOLD MINNIG. J. Am. M. Ass., Chicago, 1920, 74, 1445.

In the author's study marital tuberculosis was found to be 8.76 per cent. When the consort died the mate was infected in 50 per cent of cases. Adults can be infected and this fact should always be borne in mind. The figures apply to dispensary cases. In private life the incidence of marital infection is smaller.—P. G. H.

1452. *Sulla ricalcificazione e decalcificazioni dell'organismo tubercoloso.* (*The Recalcification and Decalcification of the Tuberculous Organism.*) E. CERASOLI. Arch. di farmacol. sper., Roma, 1919, 18, 93-96.

Lecithins and various salts determine the alkalinity of the blood. In tuberculous persons the alkalinity of the blood is reduced, due to a disturbance of the chemical equilibrium of the various salts with the consequent abnormal excretion of calcium. This is brought about by the action of microbial toxins on calcium salts.

The decalcification process disturbs other equilibria with the resulting elimination of magnesium phosphorus, chlorides, etc., in the urine. The physiological powers altered by the elimination of salts may be brought to normal by the introduction of calcium salts in an assimilable form. This must be done by the hypodermic injection of organic calcium salts. The calcium salts now given orally are useless as they precipitate in the presence of alkali in the intestinal tract.—P. M.

1453. *Secondary Invaders of Tuberculous Lungs.* JOHN N. HAYES. Am. Rev. Tuberc., Balt., 1920, 4, 87-99.

This study was made from 90 autopsies performed at United States Army General Hospital 19. From the lungs and cavities the more important organisms isolated and grown were hemolytic streptococci, influenza bacilli, *Staphylococcus aureus*, pneumococci and non-hemolytic streptococci. These organisms, and especially hemolytic streptococci, were found in such a large percentage of cases that the author concludes they are probably factors in cavity formation. They were often found in the caseation which precedes cavitation. Emphasis is placed on the importance of mixed lung infection in wards of military hospitals where large numbers of men are treated.—T. G. H.

1454. *Trauma and Tuberculosis.* THOMAS OLIVER. Practitioner, Lond., 1920, 104, 321-329.

Several cases of tuberculosis following injury are reported. The author does not believe "traumatism per se can bring into existence a disease of the lungs so distinctly microbial as pulmonary tuberculosis," but is ready to admit a liberation of microorganisms which may cause any acute infection.—C. P. B.

1455. *Über das Vorkommen roter Blutkörperchen in dem Miliartuberkeln der Milz.* (*The Occurrence of Erythrocytes in the Miliary Tubercles of the Spleen.*) O. HEITZMANN. Virchow's Archiv f. path. Anat. (etc.), Berl., 1920, 227, 174.

The author explains the occurrence of red blood corpuscles in the miliary tubercles of the spleen and not of those in other organs, by the difference in the blood and lymph circulation of that organ.—S. A. G.

1456. *Zur Frage die Kieselsäuretherapie bei Lungentuberkulose.* (*Silicic Acid Therapy in Pulmonary Tuberculosis.*) A. KESSLER. Deutsche med. Wchnschr., Berl. & Leipz., 1920, 46, 239-240.

In 16 cases that were under observation, administration of silicates promoted an increase in the number of leucocytes, especially the neutrophils, and improved the blood picture by ripening of the nuclei. Since these blood changes are desirable ones it is concluded that silicic acid in phthisiotherapy is to be recommended. Clinical results appear to confirm this observation. Demineralization of the body through malnutrition is held to be a cause rather than a result of tuberculous infection.—B. C.

1457. *Zur Methodik der Kieselsäuredarreichung bei Lungentuberkulose.* (*Administration of Silicic Acid in Pulmonary Tuberculosis.*) A. KÜHN. München. med. Wchnschr., 1920, 67, 253-255.

Long continued administration of silicic acid to persons suffering from pulmonary tuberculosis is claimed to be beneficial. It increases resorption and stimulates fibrosis and scar formation.—B. C.

## DISEASES OF CHILDREN

(See also Numbers 1500, 1508)

1458. *Sul comportamento del liquido cefalorachidiano nella pertosse.* (*The Behavior of Cerebrospinal Fluid in Pertussis.*) G. GENOESE. Policlin., Roma, 1920, 27, 291-296.

In pertussis the cerebrospinal fluid is limpid, at high pressure, with normal albumin without reticulum; the chlorides are normal, acetone is absent, and the Boveri reaction is negative. There is a noticeable increase in reducing substances.—P. M.

1459. *"Diarrhée commune des nourrissons élevés au lait de vache."* (*The Ordinary Diarrhea of Infants Fed on Cows' Milk.*) A. B. MARFAN. Nourrisson, Paris, 1920, No. 2, 92-96.

After considering the bacteriology of the diarrheas of infants fed on cows' milk, Marfan concludes:

1. Ordinary diarrhea of infants fed on cows' milk may perhaps at times be caused by an organism taken into the digestive tract.

2. In this diarrhea there is not always a change in the flora of the fecal matter. Most often there is a predominance of certain organisms which are a part of the normal intestinal flora; their increase seems to be the result and not the cause of the process which determines the diarrhea.

3. It is probable, however, that the multiplication of certain species may lead to an aggravation of the condition and give rise to complications.

According to the predominating organisms, acids and the products of putrefaction irritate the intestinal mucosa and perhaps cause some general intoxication. The blood stream may be invaded by the bacteria. Usually this occurs only shortly before death. At times it occurs earlier causing fever and increased nutritional disturbance, and by localizing of the colon bacillus may give rise to pyelo-cystitis.—H. A. R.

1460. *Specific Nature of the Hemolytic Streptococcus of Scarlet Fever.* RUTH TUNNICLIFF. J. Am. M. Ass., Chicago, 1920, 74, 1386.

The serum of sheep immunized with hemolytic streptococci from the throat in the acute stage of scarlet fever has been found to contain opsonins and agglutinins for the hemolytic streptococci that prevail in the throat and complicating lesions early in the disease, but not for hemolytic streptococci from other sources. Absorption tests also showed that the hemolytic streptococcus from scarlet fever forms a distinct group. A serum produced with this hemolytic streptococcus may prove to be of diagnostic value.—P. G. H.

1461. *Sur la diphtérino-réaction (Réaction de Schick).* (*The Schick Reaction.*) J. RENAULT. Bull. Acad. de méd., Par., 1920, 83, 130-132.

As a result of the study of 281 tests the author recommends the Schick reaction as having great importance. The susceptible individuals can be selected from a group by this means, thereby avoiding the use of serum in those not susceptible.—G. H. R.

## GYNECOLOGY AND OBSTETRICS

(See also Number 1448)

1462. *Il trattamento di alcune infezioni puerperali col siero normale.* (*The Treatment of Puerperal Infections with Normal Serum.*) O. CIGNOZZI. Policlin., Roma, 1920, 27, 259-261.

Clinical studies on 100 cases of uterine infections lead the author to the following conclusions: (1) Normal horse serum and especially ass serum exert a definite beneficent action in intra-uterine infections, which may develop into serious puerperal fever; (2) 60 cc. are injected daily subcutaneously. In serious cases injections are made from 3-5 days successively, employing in all about 250 cc. of serum; (3) except for some cases of urticaria no reactions take place; (4) the fever falls in 24 to 48 hours after injections; (5) favorable results are obtained in at least 90 per cent of the cases. The action of the serum is quick and efficacious.—P. M.



1483. *Vorschlag zur Verhütung luetischer Infektionen bei Hebammen und Gebärenden. (Plan for the Prevention of Syphilitic Infection in Midwives and Women in Labor.)* L. HAUCK. München. med. Wchnschr., 1920, 67, 262-263.

"The best effective protection against the spread of syphilitic infection during labor may be attained through enforcement of the rule that midwives wear rubber gloves in the practice of their duties."—B. C.

## DERMATOLOGY

(See also Number 1479)

1484. *Anthrax: Comparison of Surgical and Nonsurgical Methods of Treatment. A Review of Fifty-one Cases Treated at the Massachusetts General Hospital from 1888 to 1918.* ALBERT J. SCHOLL. J. Am. M. Ass., Chicago, 1920, 74, 1441.

The patients treated nonsurgically were confined in bed and the lesions left absolutely alone and exposed to the air. No special measures were carried out. Of these 7 per cent died. Of those treated surgically 44 per cent died. Early diagnosis was made by bacteriological examination and the anthrax bacilli were found in 81.2 per cent of the cases examined.—P. G. H.

1485. *A Case of Purpura During Serum Disease.* H. E. MELENY. Am. J. M. Sc., Phila., 1920, 159, 555-561.

The author reports a case of purpura occurring during the course of serum disease following the administration of antipneumococcus Type I horse serum in pneumonia. The patient, a young man of 20 years, was admitted suffering from lobar pneumonia. Pneumococcus Type I was recovered from the sputum. Blood culture gave no bacterial growth. He had never received antitoxin of any kind. Intracutaneous tests were negative against horse serum. Intravenous injection of 100 cc. antipneumococcus serum diluted with 100 cc. of normal saline was given. Another 100 cc. of serum was given after eight hours, and a third dose was given twelve hours later. A slight chill with dyspnoea as well as a slight rise (1°C.) of temperature, followed the first injection; the other two injections gave no discomfort. On the seventh day after the first administration of serum, the onset of serum disease occurred with purpura. This condition did not clear up until after the thirtieth day. The patient's blood showed precipitins against horse serum on the eleventh day after receiving the first dose of the antipneumococcus serum and was still present on the thirty-sixth day. The author gives very full data on the clinical condition with results of blood examinations, etc. The literature upon the subject is reviewed, and the theoretical aspect of the subject is discussed. It was considered "probable that the purpura was due to the presence of a toxin associated with the attempt of the body to eliminate the foreign protein." The evidence indicated that the lesion was located in the capillary walls.—L. W. F.

1486. *Nocardiosis cutis Resembling Sporotrichosis.* W. H. GREY. Arch. Dermat. & Syph., Chicago, 1920, 2, 137-143.

A case resembling sporotrichosis is reported in which a nocardia was isolated on culture. The bacteriology of this organism and the histopathology of the lesions are presented, with a note on the classification of this strain.—R. D. H.

1487. *The Histogenesis of Molluscum Contagiosum.* L. B. KINGERY. Arch. Dermat. & Syph., Chicago, 1920, 2, 144-162.

The author refers to a previous article on the experimental production of molluscum contagiosum by a filterable virus and states that the lesions so produced form the basis of the present observations, in which the histologic examination reveals that the lesions in man are limited to the pilosebaceous epithelium. This is not true of its analogue in fowls, molluscum epithelial. He suggests the possibility of a common etiology of the two conditions since they are clinically and pathologically similar and states that further experiments are being done to determine the point.—R. D. H.

1488. *The Association of Herpes Zoster and Varicella.* E. L. McEWEN. Arch. Dermat. & Syph., Chicago, 1920, 2, 205-214.

A case of associated herpes zoster and varicella is presented, and those previously reported are classified into four groups. A discussion is given of clinical factors which should be carefully noted in order to bring out more definitely a possible etiologic relationship.—R. D. H.

## OPHTHALMOLOGY

(See also Number 1384)

1489. *Ueber Augenerkrankungen im Gefolge der Grippe-epidemien 1918-1919. (Eye Involvements Following the 1918-1919 Influenza Epidemics.)* RICHARD HESSBERG. München. med. Wchnschr., 1920, 67, 207-210.

Affections of the eye as accompaniments or sequelae of epidemic influenza are quite numerous. The cornea is often severely attacked and the uvea even more seriously. The eye symptoms seem to be bound up in general with meningeal and cerebral pathological processes.—B. C.

1470. *Phlyctenular Disease and its Cause.* H. M. LANGDON. Penn. M. J., 1920, 23, 590-592.  
Attention is called to the apparent relationship between phlyctenular disease and tuberculosis.—C. P. B.

OTOLOGY AND NOSE AND THROAT DISEASES

1471. *Vincent's Disease.* J. J. SHEA. South. M. J., Birmingham, 1920, 13, 524-528.  
A brief descriptive article covering the etiology, bacteriology, pathology, clinical diagnosis, and treatment.—J. H. B.
1472. *Ueber akute nekrotisierende Amygdalitis, Pharyngitis und Laryngitis bei Influenza.* (Acute Necrotizing Tonsillitis, Pharyngitis and Laryngitis in Influenza.) PROF. VEESÉ. Berl. klin. Wchnschr., 1920, 57, 224-226.  
A discussion of 5 cases of influenza which on autopsy showed extensive necrotic tonsillitis, pharyngitis and laryngitis—a condition that may easily be mistaken for diphtheria. Contrary to usual experience in influenza, this acute necrosis was observed to radiate from the tonsils toward the larynx rather than in the reverse direction.—B. C.
1473. *Nose and Throat Lesions Associated with Pulmonary Tuberculosis.* H. H. FARNSLER. Penn. M. J., 1920, 23, 318-322.  
In a series of 3151 cases with pulmonary tuberculosis, there was an average of 20 per cent with tuberculous laryngitis; in 2635 cases with pulmonary tuberculosis, 27.6 per cent had diseased tonsils.—C. P. B.
1474. *Acute Otitis Media Complicating Epidemic Influenza.* J. C. KEELER. Penn. M. J., 1920, 23, 325-328.  
Dust was considered an important predisposing factor in transmitting influenza. A threatened outbreak was checked by spraying the noses and throats of an entire regiment.—C. P. B.

ORAL BACTERIOLOGY

(See also Number 1325)

1475. *A Clinical Study of the End-Results of Some Focal Infections.* BRYCE W. FONTAINE. J. Am. M. Ass., Chicago, 1920, 74, 1620.  
The author cites a number of cases where pain, fever and headache were directly traceable to focal infections and states that the most effective measure for relief is complete eradication or a cure.—P. G. H.
1476. *Ulcerative Gingivitis or Stomatitis—Which?* D. H. STEWART. West. M. Times, Denver, 1920, 39, 267-269.  
Clinical diagnosis and treatment are discussed.—C. P. B.

FILTERABLE VIRUSES

1477. *Études sur la peste aviaire.* (Studies on Avian Plague.) C. JOUAN AND A. STAUB. Ann. de l'Inst. Pasteur, Par., 1920, 34, 343-357.  
This contagious disease of fowls is shown again to be due to a filterable virus. All attempts to cultivate the virus failed, except when eggs, which had been incubated for 3 days, were used as a medium. In these eggs, the virus apparently multiplied and was carried through six passages.  
A vaccine prepared by heating virulent blood to 56°C. for one-half hour was used to immunize chickens. The serum of chickens thus treated was found to be actively antimicrobial and protected other fowls against the virus.—S. B.-J.
1478. *Note sur l'étiologie et l'anatomie pathologique du typhus exanthématique au Mexique.* (Note on the Etiology and Pathological Anatomy of Typhus exanthematicus in Mexico.) S. B. WOLBACH AND J. L. TODD. Ann. de l'Inst. Pasteur, Par., 1920, 34, 153-158.  
The vascular and cutaneous lesions of typhus exanthematicus in Mexico were found to be identical with those of European typhus fever. In the vascular lesions of Mexican typhus a microorganism was found, morphologically similar to, but different in its grouping and method of reproduction, from the microorganism of Rocky Mountain spotted fever. The name *Dermocentrozensus typhi* is suggested for this parasite.—S. B.-J.

## SURGICAL BACTERIOLOGY

1479. *Anthrax from the Shaving-Brush and Primary Anthrax Meningitis.* H. W. CAREY. Am. J. M. Sc., Phila., 1920, 159, 742-746.

The author reports a case of localized anthrax infection in a man following the use of a new shaving brush. The lesion was on the right side of the neck below the angle of the jaw, at the site of a pimple which was present before shaving. The top was cut off during the procedure and bled some. It became sore shortly after and developed into a pustule. On examination the lesion showed the characteristic appearance of an anthrax lesion, and the organism was demonstrated by bacteriological examination. A blood culture taken on day after admission gave negative results. The infected area was completely excised with a wide margin of healthy tissue, and the wound sutured without drainage. No local treatment was used, nor serum given, as it was not available. The patient was discharged well at the end of one week. Cultures made from bristles of the shaving brush for the anthrax bacillus failed owing to the overgrowth of contaminating organisms. But the author feels that the brush was the source of infection as the patient had not been in contact with any of the common sources of anthrax infection. The author reviews the reports of other investigators upon the same subject, and recapitulates their findings. He also directs attention to the fact that an anthrax meningitis may occur without any apparent point of entry. Anthrax bacilli may be found in large numbers in the spinal fluid which is always bloody.—L. W. F.

1480. *Wunddiphtherie und Hospitalbrand.* (Wound Diphtheria and Hospital Gangrene.) PROF. WIETING. München. med. Wchnschr., 1920, 67, 262.

Wound diphtheria, a rare condition in times of peace has increased as a result of war conditions. The relation of this disease to the hospital gangrene of former times is pointed out.—B. C.

1481. *Ueber Knochenüberpflanzung in aseptische und in infektiöse Defekte,—ein Beitrag zur Erwerbung örtlicher Gewebsimmunität.* (Bone Transplantation in Aseptic and Infected Cavities. A Contribution on the Development of Local Tissue Immunity.) M. KATZENSTEIN. Deutsche med. Wchnschr., Berl. & Leipz., 1920, 46, 240-242.

Aseptic bone transplantations in 14 cases gave only one in which sequestrum formation occurred, all the others healing completely and aseptically. In bone transplants into infected tissue there was a considerable difference depending on the site of origin of the transplant. In 11 cases, apparently aseptic following infantry wounds, the transplant was secured from the healthy tibia, yet there occurred in 8 of them either suppuration or fistula formation. On the other hand, in 7 transplants following severe suppuration, there resulted only one sequestrum in spite of the fact that in two instances the bone splinters were obtained while fistulae were present. The transplants in these cases were secured from bone fragments in a previously infected region. These facts appear to demonstrate that inflammation produces a local tissue immunity.—B. C.

## SEROLOGY

(See also Number 1336)

1482. *The Relation of the Rate of Absorption of Antigen to the Production of Immunity.* MARJORIE W. COOK. J. Immunol., Balt. & Cambridge, Eng., 1920, 5, 39-49.

Two series of experiments on rabbits indicated that the production of antibodies is noticeably influenced by the use of electrolytes during immunization.

*Experiment I.* (a) Three rabbits were treated 5 successive times at 5-day intervals with intravenous injections of 1 cc. of  $\frac{N}{10}$  sodium citrate, followed immediately with an intraperitoneal injection of 1 cc. of a 2 per cent powdered egg albumen.

(b) Same as (a) using calcium chloride.

(c) Control. Injected with egg albumen only.

The precipitating titre of the serum from each animal was taken immediately preceding each injection, and 1, 2, 4, 6, 24, and 48 hours following. Antigen was first detected in the blood of the control animals at an interval of 4 hours after the intraperitoneal injection. In marked contrast to this the sodium citrate animals gave evidence of absorption in every case after an interval of 1 hour. Of the calcium chloride animals, No. 5 gave no evidence of absorption at any time; No. 4 gave positive tests for antigen after an interval of 24 hours in 4 out of 5 injections; No. 6 was absorbed in the blood after an interval of 6 to 8 hours. Variations in the antibody content paralleled the differences in the rates of absorption of the antigen. Fourteen days after bleeding the sodium citrate series gave a positive titre of (1) 1-51200, (2) 1-25600, (3) 1-51200; the calcium chloride, (4) 1-400, (5) 1-100, (6) 1-1600; the control, (7) 1-3200, (8) 1-3200, (9) 1-1600.

The leucocyte count, made before each injection and for periods of 4 to 8 days following, revealed nothing important in reflecting changes in immunity production.

*Experiment II.* Following essentially the method of Experiment I, rabbits were treated with heated typhoid bacilli. Animals receiving sodium citrate showed throughout a much higher titre than the controls, while animals receiving calcium chloride were lower in titre than the controls.

The conclusion is reached that a rapid rate of absorption of antigen was followed by an increased production of antibody, while a retarded rate of absorption was accompanied by a marked decrease in the production of antibody. It seems that the condition of permeability of the cell with respect to its absorptive powers is an important factor in the production of immunity.—R. R. H.

1483. *Pneumococcus Cultures in Whole Fresh Blood. I. The Retardative Effect of the Blood of Immune Animals and the Mechanism of the Phenomenon.* C. G. BULL AND L. BARTUAL. J. Exper. M., N. Y., 1920, 31, 233-251.

Following the work of Wright, who pointed out the pneumococidal action of whole uncoagulated human blood, and of Heist and others, who extended this work to include experimental animals, and utilizing the same technic, the authors demonstrate that the fresh whole blood of immune animals is not highly pneumococidal, but rather retards the growth of the cultures with sometimes as long a latent period as 72 hours, and that in a general way the rapidity of multiplication of the organisms is proportional to the susceptibility of pneumococcus infection of the animals used. For example, the latent period in rabbits and mice was very short, 4-1 hour, sheep and man 2-3 hours, and pigeons 6-12 hours, using undiluted cultures before there was evidence in microscope smears of multiplication of the organisms. The method employed was to fill a series of small capillary tubes by capillary attraction to a definite level with graded dilutions of an 18-hour blood broth culture of pneumococci, then immediately expel the culture, leaving a coating of culture on the walls of the tubes, dry in air a few minutes, and refill to the same level with the fresh whole blood to be studied. The tubes were sealed with paraffin and incubated at 37°C. for varying intervals, when smears were examined and cultures seeded in rabbit blood agar slants. Examination of the smears gave an indication of the extent of multiplication of organisms, whereas the consistently positive cultures indicated that the sera were not pneumococidal. A study of the relative number of organisms in the free serum, in the serum adhering to the clot, and in the interior of the clot, at varying periods, showed that in the early stages the organisms multiplied rapidly in the serum, fewer in the serum adherent to the clot, and the clot itself was not invaded until the cultures were well developed. Chain formation and clumping was noted in the immune blood but not in the normal blood controls. In a study of the relationship of phagocytosis to this phenomenon, the same technic was carried out, using whole blood, defibrinated blood and serum, and it was found that rapidity of multiplication was greatest in the serum, which was relatively free from leucocytes and an excellent medium for growth; somewhat less rapid in the defibrinated blood, where three-fourths of the leucocytes were removed by defibrination, the large percentage of the remainder being lymphocytes; and slowest in the blood, due to the presence of the leucocytes. This was further demonstrated by the fact that growth was even more inhibited in a medium containing equal parts of plasma and leucocytic cream than in the whole blood; and again by the fact that if the cells were destroyed by grinding up in a mortar in fine sterile sand, using either centrifuged whole blood cells or leucocytes or leucocytic cream, no retardation occurred. The presence of opsonin was also an important factor in the inhibition due to phagocytosis, and the authors found that sedimented cells from an immune blood, containing enough serum adherent to the cells to opsonize the bacteria, caused marked retardation of growth.—W. P. B.

1484. *Experiments on the Production of Specific Antisera for Infections of Unknown Cause. III. The Effects of a Serum Precipitin on Animals of the Species Furnishing the Precipitinogen.* P. ROUS, G. W. WILSON AND J. OLIVER. J. Exper. M., N. Y., 1920, 31, 253.

It has been found that sera can be obtained specifically effective against certain infections in which the etiological agent is unknown, by using infected tissue itself as antigen. The question then arose as to whether serum could be used as antigen, and if so, whether it would give rise to injurious principles in the antiserum.

In the study the authors found that a serum of high precipitin titer, produced by the repeated injection of rabbits with the blood-free serum of guinea pigs or dogs, possessed a principle highly toxic for animals of the species furnishing the antigen. Intravenously the serum caused severe shock, resembling an anaphylactic reaction, but could not be prevented by careful desensitization. The animals that succumbed showed acute central congestion of the lobuli of the liver with small hemorrhages and later necrosis, and petechial hemorrhages in the lungs and intestinal mucosa.

By selective absorption with guinea pig red cells, all demonstrable hemolysins and hemagglutinins were removed, yet there was no diminution in toxicity of this serum. Then precipitin was removed by specific precipitation with normal guinea pig serum at the dilution found to result in the maximum precipitation. However, the results indicated an increase rather than a decrease in toxicity as a result of absorption of hemolysin, hemagglutinin and precipitins. This was repeated with other rabbit sera, with absorption of precipitin prior to absorption of hemolysin and hemagglutinin and with rabbit sera immunized against dog serum instead of guinea pig serum, with the same results.

The authors raise the question as to whether this toxic principle is a hitherto unrecognized antibody or a toxic product of the interaction of precipitin and precipitinogen, and point to the practical conclusion that unless the obstacle of their presence is in some way overcome, the body fluids of infected individuals cannot be used for the production of antiserum.—W. P. B.

1485. *The Influence of Desiccation upon Natural Hemolysins and Hemagglutinins in Human Sera.* JOHN A. KOLMER. J. Immunol., Balt. & Cambridge, Eng., 1919, 4, 393-402.

Human sera used for typing blood should be kept at a low temperature, sealed in ampoules and in a liquid state, as the hemagglutinins and hemolysins in normal human sera are highly susceptible to heat. The writer, by experiment, shows that the normal iso-hemagglutinins in human sera deteriorate very rapidly (evident from 1-4 days) when dried and kept at room temperature. Similar effects were obtained with the hemagglutinins in human serum for the corpuscles of the lower animals.

Type human sera containing large amounts of normal hemagglutinins when properly dried and stored in the refrigerator may prove satisfactory for microscopical tests for at least two weeks. The hemolysins of normal human sera for the corpuscles of persons and the lower animals are somewhat more susceptible to desiccation than are the hemagglutinins. Previous studies are referred to in which the writer claims that sera are occasionally encountered containing natural iso-hemolysins but no iso-agglutinins for the corresponding corpuscles. The practice of using dried human sera for agglutination tests after the methods of Sanford and Hartman may be open to error due to deterioration of the normal iso-agglutinins.—R. R. H.

1486. *The Nature of Thermolabile Hemolysins.* JOHN A. KOLMER. J. Immunol., Balt. & Cambridge, Eng., 1919, 4, 403-424.

Thiele and Embleton found that the absorption of normal sera at low temperature with sheep cells removed at the same time all or part of the complement indicating that "the hemolytic substance appears to be complement so modified that it can combine directly with the red cells in the cold and directly cause hemolysis." The writer, following essentially the same method of study, could find no evidence for the view that hemolysins are differentiated complements.

The natural hemolysins in human serum are inactivated (markedly) or destroyed when heated at 56°C. and totally destroyed by heating at 62°C. The natural hemolysins in human serum vary in resistance to heat, anti-sheep being among the most resistant, anti-guinea pig the most susceptible.—R. R. H.

1487. *Studies on the Meningococcal Activity of Blood.* TOITSU MATSUNAMI. J. Immunol., Balt. & Cambridge, Eng., 1920, 5, 51-71.

By means of the Lacy-Heist method—a modification of the many stemmed capillary pipettes of Wright—the writer studied the meningococcal activity of rabbit blood immunized with virulent meningococci. It was found that normal rabbit blood and serum kill large numbers of virulent meningococci *in vitro* within 3 hours. Whole blood is more bacteriolytic than the serum. The meningococcal activity of normal rabbit serum was not increased by immunization, while the activity of the whole blood was increased up to a certain limit by injection of living and autolyzed meningococci. Highly immunized rabbit blood was sometimes less bactericidal than that of slightly immunized rabbit blood.

The meningococcal activity of whole blood of the immune rabbit is much stronger than that of the serum, defibrinated blood, blood cells plus serum or citrated blood of the same rabbit.

It is suspected that at least one factor in explaining the higher meningococcal activity *in vitro* of immune rabbit blood, compared with defibrinated blood, citrated blood and serum lies in the influence of coagulation which favors the phagocytosis of the meningococci. The test cannot be accepted on the basis of this investigation for the purpose of determining the artificially induced immunity against meningococci.—R. R. H.

1488. *Appearance of Isoagglutinins in Infants and Children.* W. M. HAPP. J. Exper. M., N. Y., 31, 313.

The isoagglutination reaction of 131 infants and children from birth to 10½ years was examined by testing their serum and washed corpuscles microscopically by the hanging drop method against the serum and corpuscles of each of the 4 adult groups (Moss) to determine how soon the groups were established and in what order.

It was found that the grouping as present in adults was rarely present in blood from the umbilical cord. Also, isoagglutination was rarely present at birth and during the first month, but the percentage increased with age so that after one year the group was usually established, and after two years was always present as in adults. The grouping was established in the corpuscles before it was established in the serum. Therefore, Group I was the first to be formed and Group IV the last. The earlier establishment of the group in the corpuscles before the group was established in the serum was liable to change the final grouping, but when once established in both serum and corpuscles, it did not change.

Isoagglutinins identical with those in the mother's blood were found in the mother's milk, but often did not conform to the group in the infant. On account of the differences between the agglutination reaction in the blood of mother and child, the danger of transfusion without making preliminary tests is evident.

The important literature is reviewed.—W. P. B.

1489. *The Tuberculosis Complement-Fixation Test. Report of 700 Cases.* B. STIVELMAN. J. Lab. & Clin. M., St. Louis, 1920, 5, 453-455.

This study was made to determine the diagnostic and prognostic value of the complement-fixation test and its relation to active and clinically inactive tuberculosis. In this series 24 per cent of non-tuberculous and only 52.4 per cent of all definitely tuberculous individuals gave a positive reaction, while of definitely incipient cases only 33 per cent were positive.

The author found the test of no assistance in the differential diagnosis of pulmonary diseases nor could clinical activity in pulmonary tuberculosis be determined by complement fixation. Also the test failed to shed any light upon the immediate prognosis.—F. W. H.

1490. *De l'emploi de l'éther acétique comme réactif précipitant des protéides.* (The Use of Ethyl Acetate as a Reagent for the Precipitation of Proteins.) A. MARIE. Ann. de l'Inst. Pasteur, Par., 1920, 34, 159-161.

Ethyl acetate (acetic ether) is an active precipitant of proteins, albumoses and peptones. In layer tests, a definite ring of precipitate is obtained with dilutions of egg albumin as high as 1-10,000. Dialyzed tetanus toxin, tuberculins from synthetic media and normal urine form precipitates with this reagent. The author finds it superior to acetone as a protein precipitant.—S. B-J.

1491. *Études sur la précipitation mutuelle des anticorps et des antigènes.* (Première mémoire.) Sérum "antisérums." (Studies on the Mutual Precipitation of Antibodies and Antigens. I. Antisera to Animal Sera.) M. NICOLLE, E. CÉSARI AND E. DEBAINS. Ann. de l'Inst. Pasteur, Par., 1920, 34, 149-152.

This is the first paper of a series of studies of the nature of antibodies and antigens. A method is described by which the antibody and antigen may be titrated directly in the precipitation reaction. To avoid the solution of the precipitate in an excess of antigen, agar or gelatin is added to the antigen (horse serum) and the antihorse serum is layered upon this solid mixture. A precipitate occurs at the junction of the fluid and agar-mixture, and is not dissolved when the antigen is in excess. The specific effects of the various dilutions of the antibody can be readily determined.

The antibody (precipitin for horse serum) was found to be entirely in the globulin fraction of the serum. The antigen of horse serum was present in both the albumin and globulin fractions.

Heat of boiling water for 5 minutes almost completely destroyed the antibody, and treatment of horse serum with a mixture of alcohol and ether removed the antigenic fraction of this serum.—S. B-J.

1492. *Serologische Versuche mit Antigenen und Antikörpern an der überlebenden künstlich durchströmten Leber.* (Serological Tests with Antigens and Antibodies on the Living Liver by Means of Perfusion.) MARTIN HAHN AND EMIL V. SKRAMLIK. Biochem. Ztschr., Berl., 1919, 98, 120-140.

A preformed substance is found in the liver cells, which is able to increase the action of cobra toxin on sheep red blood cells. Under the influence of the toxin this substance passes out into the circulating fluid. Its presence in the liver cells may also be demonstrated by studies of the expressed tissue juices. The circulating cobra toxin evokes a destruction of liver tissue as evidenced by the appearance of protein in the perfused fluid. The remaining cells are so altered that even after complete washing out of the toxin, newly introduced red blood cells are hemolyzed.

Blood cells laden with amboceptor are retained in the capillary region of the portal vein as a result of agglutination. Bordet's assumption that hemagglutination is a precursor of hemolysis is confirmed. Hemolytic amboceptors are taken up by the liver cells.

Circulating agglutinins are taken up by the liver tissue. They are not removed by perfusion and agglutinate bacteria which are introduced. All of these phenomena show the evident relationship of the liver to the various serological processes.—R. E. B.

1493. *Études sur le pneumococque.* (Onzième mémoire) Races du pneumococque. (Studies on the Pneumococcus. XI. Races of the Pneumococcus.) M. NICOLLE AND E. DEBAINS. Ann. de l'Inst. Pasteur, Par., 1920, 34, 177-180.

Evidence is presented somewhat opposing the doctrine of specific type of pneumococci. The different types, corresponding to the American classification, were partially distinguishable by agglutination tests with sera of horses immunized to separate strains of pneumococci. Each type of pneumococcus is regarded as a mosaic of antigenic substances, and it was found that the Type II antigen predominated in the hyperagglutinable strains. No other property of the pneumococci, except the mucous growth of Type III, was found to correspond with the agglutination reactions.

Bactericidal, lytic tests and complement fixation tests do not distinguish between the types as based upon agglutination reactions.—S. B-J.

1494. *Complementary and Opsonic Functions in their Relation to Immunity. A Study of the Serum of Guinea Pigs Naturally Deficient in Complement.* HIRAM D. MOORE. *J. Immunol.*, Balt. & Cambridge, Eng., 1919, 4, 425-441.

A stock of guinea pigs that had been bred at the Veterinary Laboratory of the Vermont State Agricultural Experiment Station was found to be very deficient in complement. In fact, 1 cc. gave practically no hemolysis when tested with sensitized horse, sheep, and human cells. With this favorable material, a number of experiments led to the following conclusions:

1. After injection of a series of complement deficient and normal guinea pigs with killed bacteria, no increase in the complement content of the blood was noted confirming the original observation of Von Dungern that the complement content of the blood is not affected by the process of antibody formation. Ten days after the last injection of these animals with the killed bacteria, live bacteria were injected. The fatalities were such in the normals and complement deficient pigs that the writer concludes that the deficiency in complement did not interfere with immunity acquired through systematic immunization.

2. Live cultures of *B. cholerae suis* were injected into non-immunized guinea pigs (complement deficient and complement normal). Of 100 complement deficient, 77 succumbed, while only 20 of the 100 complement normal pigs similarly treated died. This would seem to indicate that associated with a natural deficiency of complement there is a deficiency in natural resistance to artificial bacterial infection.

3. The opsonic index was determined in 25 cases with the typhoid bacillus after the method of Wright. A count of about 100 white cells from each of the 25 normal pigs showed that they had taken up 16,464 bacteria. A similar determination in the complement deficient gave a total count of 7817. The average opsonic index of complement deficient serum is 0.4748. The complement and opsonins bear a definite relation to each other.—R. R. H.

1495. *Les sérums antiprotéolytiques. Leur spécificité. La réaction de l'antiprotéase. (Antiprotease Sera. Their Specificity. The Antiprotease Reaction.)* L. LAUNOY. *Ann. de l'Inst. Pasteur*, Par., 1920, 34, 249-270.

Animals (rabbits) were injected subcutaneously with filtrates of the cultures of such proteolytic organisms as *B. pyocyaneus*, *B. prodigiosus*, and *V. cholerae*. Antibodies were formed in the sera of these animals, which inhibited the proteolytic action of the bacterial filtrates. The antisera were about 20 times as inhibitory as normal serum. These antibodies were specific, inhibiting only the protease of the bacterium to which the animal was immunized. The reaction was general for all strains of any particular proteolytic bacterium. For example, the antiprotease serum of an animal immunized with the filtrate of one strain of *B. pyocyaneus* inhibited the proteolytic action of filtrates of other strains of this organism, regardless of the differences of chromogenesis or agglutination reactions. Antiprotease is a different antibody from agglutinin.—S. B-J.

1496. *On the so-called Neisser-Wechsberg Inhibiting Phenomenon in Bactericidal Immune Sera.* TH. THØRTA. *J. Immunol.*, Balt. & Cambridge, Eng., 1920, 5, 1-38.

The different explanations of the complement-deviation phenomenon given by Neisser-Wechsberg, Gruber, Lipstein, Levaditi, Gay, Sormani and Brekke are rejected by the writer as a result of his work with dysentery, rabbit immune sera. The writer follows the usual methods in such tests and by many carefully planned experiments attempts to show:

1. The conception of Neisser and Wechsberg that the great surplus of bactericidal antibodies make the action of complement impotent is impossible because, (a) there is no relation between the bactericidal titer and the inhibiting titer; (b) immune sera are encountered with high bactericidal titer but without inhibiting action; (c) inhibition is to be found in sera from which bactericidal amboceptors have been removed by absorption with homologous antigen.

2. The theory of Sormani that an antibody is produced during active immunization that renders the bacteria invulnerable to the action of the bactericidal amboceptor-complement complex is rendered untenable, (a) the hypothetical antibody cannot be absorbed from the inhibiting serum; (b) bacteria sensitized with the inhibiting serum are as vulnerable to the bactericidal amboceptor-complement complex as untreated bacteria.

3. The hypothesis that inhibiting antibodies act by attaching themselves to the antigen thereby interfering with the union of the antigenophil group of the bactericidal amboceptor is excluded by the fact that, (a) the bactericidal amboceptors can be absorbed from the serum by the bacteria in the presence of the inhibiting antibodies without the latter becoming attached to the bacteria. They remain free in the fluid.

4. The theory that an antiamboceptor is produced during immunization that fixes itself to the antigenophil group of the amboceptor is rejected for the reason that, (a) if an anti-amboceptor connected with its homologous amboceptor could absorb all of the complement, the nature of the antigen would play no part in the inhibition and the inhibition would take place against any bacteria tested in an inhibiting serum.

5. The hypothesis that antiamboceptors of the nature of complementoids, that is, antibodies that act against the complementophil group of the amboceptor may be produced by immunization cannot be sustained because, (a) such antibodies would not prevent the union of the bactericidal amboceptor with the bacteria but would prevent the subsequent coöperation of complement. Accordingly bacteria, after contact with an inhibiting concentration

of immune serum should be invulnerable to the action of fresh active serum, since all the receptors are supposed to be satisfied; (b) an absorbed inhibiting immune serum should possess bactericidal power as its complement should remain unaltered in the fluid after absorption.

6. The theory is advanced by the writer that during immunization specific antibodies are produced, which in connection with dissolved antigen, absorb complement with greater avidity, so that the complement cannot effect its bactericidal action. These are not identical with agglutinins, bacteriolysins or precipitins. (a) The titer of inhibition varies with the dose of complement; (b) bacteria that have been in contact with an inhibiting serum are not protected in a non-inhibiting serum; (c) the absorbed serum loses all its former bactericidal action, as no free complement is left in solution.—R. R. H.

1497. *Ueber die neueren Ausflockungsreaktionen zur Diagnose der Lues. (Newer Precipitation Reactions in the Diagnosis of Syphilis.)* DR. HUEBSCHMANN. München. med. Wehnschr., 1920, 67, 251-253.

A discourse on the Meinicke and the Sachs-Georgi reactions and their fundamental relations.—B. C.

1498. *Serologische Untersuchung von Kornrade in Mehl und Kleie. (Serological Studies of the Corncockle in Flour and Bran.)* J. BECKER. Centralbl. f. Bakteriöl. (etc.), Jena, 2. Abt., 1918, 48, 417-420.

The recognition of corncockle in foods and feeds can be carried out with certainty by means of the serum reaction, particularly if the percentage of corncockle is small or only a small sample of meal is available.—R. E. B.

1499. *Ueber den Bau des Rezeptorenapparates der paragglutinierenden Bakterien. (The Receptors in Paragglutinating Bacteria.)* PAUL BÖRNSTEIN. Berl. klin. Wehnschr., 1920, 57, 208-210.

Paragglutinating bacteria possess, in addition to their specific ortho-receptors, specific para-receptors for certain disease conditions. In experiments with a dysentery-paragglutinating strain of *B. coli*, absorption of one group of receptors reduced more or less the agglutinating power of the other. The results suggest that the Weil-Felix reaction may be looked upon as a form of paragglutination.—B. C.

## SERUM THERAPY

(See also Numbers 1337, 1468, 1485)

1500. *Vingt-cinq années de sérothérapie antidiphthérique. (Twenty-five years of Antidiphtheric Serotherapy.)* L. MARTIN. Bull. Acad. de méd., Par., 1919, 82, 173-179.

Statistics and charts are presented showing the comparison between deaths from diphtheria before and after the introduction of diphtheria antitoxin in 1894. The weekly mortality in the city of Paris for 1893 varied between a maximum of 45 and a minimum of 14. In 1918 the maximum was 4 and the minimum 1.—G. H. R.

1501. *Études sur le pneumococque. (Dixième mémoire.) Préparation et propriétés des sérums antipneumococciques. (Studies of the Pneumococcus. X. Preparation and Properties of Antipneumococcic Sera.)* C. TRUCHE. Ann. de l'Inst. Pasteur, Par., 1920, 34, 98-103.

The most satisfactory antigen for the immunization of horses was found to be a preparation of pneumococci killed by alcohol and ether. The authors found that serum from a horse immunized against one type of pneumococcus was protective also to a considerable degree against virulent cultures of other types of the organism. Antipneumococcic serum was curative in lobar pneumonia and pleurisy due to the pneumococcus, less so in pneumococcic meningitis and endocarditis. In certain hospitals where this serum was used, the mortality from pneumococcic pneumonia fell from 30 to 8 per 100.—S. B-J.

1502. *Recherches sur la préparation des sérums antimicrobiens et antitoxiques chez le cheval. (Researches on the Production of Antimicrobial and Antitoxic Sera with Horses.)* M. NICOLLE, V. FRASEY, E. DEBAINS AND E. NICOLAS. Ann. de l'Inst. Pasteur, Par., 1920, 34, 285-333.

The methods of preparing therapeutic sera from horses are described in detail. The sera studied were antityphoid, antiparatyphoid A and B, antimeningococcus A, B, and C, antipneumococcus, antishiga, antiflexner, antimelitensis, anticholera, and antigangrene. The paper contains data on the preparation of the antigens, which were usually bacteria killed by treatment with alcohol and ether, on the dosage for immunization of horses, and the care of animals during the period of the injections.—S. B-J.

1503. *Sérothérapie de la fièvre typhoïde. Mode d'emploi du sérum. Résultats cliniques. (Serotherapy in Typhoid Fever. Method of Using the Serum and the Clinical Results.)* A. RODET AND S. BONNAMOUR. Bull. Acad. de méd., Par., 1919, 81, 759-761.

The mortality of cases was 2.9 per cent after eliminating the deaths from complications and those treated after the twelfth day.—G. H. R.



1504. *La sérothérapie antigonococcique. Étude expérimental et clinique. (Antigonococcus Serum Therapy. An experimental and clinical study.)* JEAN PARAF. Thesis, Univ. Paris, 1919, Abs. in Presse. m'd., Par., 1920, 23, 208.

Based on results in experimental ophthalmia and meningitis in animals, Paraf has obtained good results in localized infections: arthritis, orchitis, etc.—L. A. K.

### ANAPHYLAXIS

1505. *Anaphylatoxine et anaphylaxie. (Anaphylatoxin and Anaphylaxis.)* A. BESREDKA. Ann. de l'Inst. Pasteur, Par., 1920, 34, 334-342.

Besredka points out that the so-called anaphylatoxins produced *in vitro* by the action of colloids or adsorbents on serum are not similar in their action to true anaphylactic shock. The most notable difference is that while these anaphylatoxins are poisonous, they do not render the animal desensitized or in the antianaphylactic condition of an animal which has survived anaphylactic shock.

Vaccination or immunization against these artificial anaphylatoxins barely protects an animal against the formerly fatal dose of the toxic serum or protein split product. But an animal strictly desensitized to an antigen to which it was originally sensitive will tolerate an almost unlimited dose of this non-poisonous antigen. A guinea pig sensitized to horse serum and also vaccinated against anaphylatoxin will suffer shock when injected with horse serum, and a desensitized guinea pig will react to anaphylatoxin. The serum of an animal vaccinated against anaphylatoxin contains a substance which neutralizes the latter, but the serum of a desensitized animal does not contain any such antibody.—S. B-J.

1506. *An Experimental Study of the Action of Ultraviolet Light on the Intradermic Tuberculin Reaction.* EDGAR MAYER. Am. Rev. Tuberc. Balt., 1920, 4, 100-111.

"The intradermic tuberculin test in guinea pigs and patients often gives a reaction of lessened extent when the injected area is treated locally with short exposures to ultraviolet light either before or after injection. Recently tanned skin also gives a slightly lessened reaction. Tuberculin exposed for a sufficient length of time (45 minutes at a distance of 2 feet) to the ultraviolet rays loses markedly, and at times entirely, its power to cause intradermic reactions."—T. G. H.

1507. *Etude sur certains phénomènes de choc observés en cliniques. Signification de l'hémoclasie. (A Study of Certain Phenomena of Shock, Observed Clinically. The Significance of the Blood Crisis.)* FERNAND WIDAL, PIERRE ABRAMI AND ET. BRISSAUD. Presse méd., Par., 1920; 23, 181.

A discussion and review of allergic phenomena. Attention is called to the vascular reaction in many anaphylactoid phenomena; lowered arterial pressure and blood coagulability; leucopenia, diminution of the number of platelets, sharp changes in the refractive index of the serum, etc. This crisis is observed in asthma and alimentary urticaria; in vaccine shock; in milk sickness. Crystalloids as well as proteins may cause this shock when injected intravenously.

A discussion of the mechanism follows. "Arguments drawn from the clinic and pathologic physiology . . . lead us to think that it (shock of this type) is a simple rupture of the physical equilibrium of colloidal structures."—L. A. K.

### VACCINE THERAPY

(See also Numbers 1323, 1413, 1425, 1477)

1508. *Sulla vaccinazione antipertossica. (Antipertussis Vaccination.)* T. LUZZATTI. Policlin., Roma, 27, 451-453.

A method for making pertussis vaccine according to Nicolle and the technic of administering same are given. The use of this vaccine in children was attended with very good results. The positive proofs obtained with prophylactic vaccination show that in all probability the bacillus of Bordet is the specific agent of the disease.

No agglutination could be shown with the serum of patients having the disease actively, nor in those of the catarrhal stage.—P. M

1509. *La pathogénie du choléra et la vaccination anticholérique. (The Pathogenesis of Cholera and Vaccination against Cholera.)* J. CANTACUZÈNE. Ann. de l'Inst. Pasteur, Par., 1920, 34, 57-87.

A vaccine made of the cholera vibrio, killed by heat at 56°C. for half an hour, was used extensively in the Blakan wars and in the recent campaigns (1916) in Roumania. The use of this vaccine was always followed by a decrease in the incidence of cholera. Epidemics of cholera were stopped when all persons of a community were vaccinated. A dosage of 3 to 4 billions of bacteria, given in two or more injections, was essential to the production of a substantial preventive vaccination. In practice, no harmful effects were consequent upon the production of a possible negative phase in the persons vaccinated. The author thinks that subcutaneous injection of the vaccine is followed first by a local immunity of the intestine, later by general immunity.—S. B-J.

1510. *Essai de traitement du typhus exanthématique par l'injection du liquide céphalo-rachidienne du malade. (An Attempt to Treat Typhus Fever by the Injection of the Patient's Cerebrospinal Fluid.)* I. SÉGAL. Presse méd., Par., 1920, 28, 271. (Suppl.)

A case of typhus (in Palestine) was treated by two subcutaneous and one intravenous injections of the patient's cerebrospinal fluid, freshly drawn, quantities of 8-10 cc. being used. Marked improvement, followed by convalescence ensued.—L. A. K.

1511. *Méningite cérébrospinale et bactériothérapie. (Cerebrospinal Meningitis and Bacteriotherapy.)* H. MÉRY AND L. GIRARD. Bull. Acad. de méd., Par., 1919, 82, 284-286.

A report of a case treated with an autogenous vaccine. Five subcutaneous treatments were given at intervals of 2 or 3 days and recovery speedily resulted. Antimeningococcus serum had been used on this case but with no amelioration of the symptoms.—G. H. R.

1512. *Osteo-periostite post-typhique traitée par un autovaccin vivant sensibilisé. (Post-typhoid Osteoperiostitis Treated with a Living Sensitized Autogenous vaccine.)* M. CIUCA AND I. ENESCU. Ann. de l'Inst. Pasteur, Par., 1920, 34, 358-359.

Osteoperiostitis of the radius in a case of convalescent typhoid fever was treated with a vaccine made from the typhoid bacillus originally isolated from the patient's blood. The living organisms were sensitized before injection by placing them in contact with the patient's serum. After four injections of the vaccine, the periostitis disappeared.—S. B-J.

1513. *The Sterilization of Lipovaccines.* P. A. LEWIS AND F. W. DODGE. J. Exper. M., N. Y., 1920, 31, 169.

It was found that *B. subtilis* contaminated a pneumococcus lipovaccine when prepared by the method of Whitmore and Fennel (i.e., dry in an oven at 53°C. over lime, grind in a jar with steel balls for a number of hours, then add a mixture of anhydrous lanolin and cottonseed oil, repeat grinding, and finally add cottonseed oil containing 0.25 per cent chloretone). The authors, therefore, exposed the finished vaccine to a temperature of 130°C. for 3 hours in an electric oven, or to 120°C. for 12 hours, which rendered it sterile. This product was found to afford a considerable degree of protection to mice for a brief period, apparently in not much less degree than the unheated vaccine. However, heating of typhoid lipovaccine in a similar manner appeared to almost totally destroy its antigenic qualities.—W. P. B.

## NONSPECIFIC THERAPY

(See Number 1526)

## EXPERIMENTAL INFECTION

1514. *A Study of Experimental Meningitis. I. The Production of Experimental Meningitis by Direct Inoculation into the Subarachnoid Space.* LLOYD D. FELTON AND PAUL WEGG-FORTH. Monogr. Rockefeller Inst. M. Research, N. Y., No. 12, 1920, 5-25.

This study was made in an effort to find an organism of high original pathogenicity within the meninges of laboratory animals in order that infections analogous to those encountered in man might be produced and therapeutic measures attempted. The cat was used chiefly for the work.

Routine injections of a number of different organisms were made into the meninges of cats, most satisfactorily through the occipito-atlantoid ligament, but sometimes also through the lumbo-sacral ligament. In a number of cases several strains of the same organism were tested, 21 varieties and 102 strains being employed in all, falling into 3 general groups:

Group I. Consisted of the bacteria that most frequently invade the meninges of man. Included meningococcus, *M. flavus*, *S. hemolyticus*, *Staphylococcus albus*, *Staphylococcus aureus*, pneumococcus and *B. influenzae*.

Group II. Consisted of miscellaneous Gram-negative and Gram-positive bacilli of relatively low virulence for the meninges of the cat. Included *B. gallinarum*, *B. subtilis*, *B. smegmatis*, *B. cereus*, *B. proteus zopfii*, *B. proteus mirabilis*, *B. anthracoides*, *S. metschnikovi*, *B. dysenteriae* (Flexner, Harris, Kruse, Hiss-Russell, Duval) and *B. typhosus*.

Group III. Consisted of highly virulent organisms. Included *B. coli* (especially *B. coli communior*), *B. pyocyaneus*, *B. paratyphosus* B, and *B. mucosus capsulatus* (especially *B. lactis aerogenes*).

The organisms included in Group I were found to possess but slight pathogenicity for the meninges of the cat, possibly because the cat is comparatively insusceptible to these same organisms on intravenous inoculation, especially when they are of human origin. The 2 strains of *Staphylococcus albus* and 4 of the strains of *Streptococcus hemolyticus* proved avirulent for the meninges of cats. Pus from staphylococcus infections in the cat and man produced meningitis, on subarachnoid inoculation, in 6 out of 8 cats, and aggressins in the filtrate from such pus, when mixed with staphylococci, promoted meningitis.

The organisms included in Group II possessed about the same natural virulence for the meninges of the cat as those of Group I, but in none of the strains was the pathogenicity uniform or of sufficient degree for the immediate purpose. Most of these organisms were

stock cultures, grown for months or years on artificial media, but still capable, on massive inoculation into the subarachnoid space, of producing fatal meningitis. This indicates that meningitic infection can be produced in cats by direct subarachnoid injection of any of the known microorganisms, provided the strain is of optimum virulence.

Of Group III, *B. lactis aerogenes* (*B. mucosus capsulatus* group) possessed the greatest natural virulence for the meninges of the cat. The strain employed was isolated at autopsy from the blood and lungs of a fatal case of bronchopneumonia. It was found to be 40,000,000 times as virulent as *B. coli* and 1,000,000,000 times as virulent as *B. paratyphosus* B and *B. pyocyaneus*, assuming that the number of organisms in a 24-hour meat infusion broth culture is the same with all four organisms. This organism, when injected in different dilutions into the subarachnoid space, failed to produce meningitis only 3 times out of 59, spontaneous recovery after the establishment of a well recognized meningitis occurring in only one case. The organism filled two prime requirements for future work on the therapy of meningitis in that it was acutely and uniformly fatal and would produce meningitis in high dilutions. The smallest dose ever employed was a 1-10,000,000,000 dilution, representing approximately 20 organisms, which killed two cats in less than 24 hours, with typical meningitis. The chief disadvantage of this high virulence was the short incubation period and the rapid fulminating type of meningitis produced, so that little time was afforded for the application of therapeutic measures. Other disadvantages were the difficulty of producing an immune serum for this organism and its relative infrequency as a meningeal invader in man.

In all acute fatal cases of meningitis following subarachnoid inoculation, the injected organism could be cultivated at autopsy from the heart's blood. In chronic cases, succumbing after one to three weeks, the central nervous system was practically normal while the heart's blood yielded positive cultures. This phenomenon was observed with *B. lactis aerogenes*, *B. coli* and *B. pyocyaneus*, and was due probably to a focal infection and subsequent terminal septicemia. In chronic cases, therefore, death was probably due to septicemia alone, while in acutely fatal cases it was due both to meningitis and septicemia.—I. W. P.

1515. *A Study of Experimental Meningitis. II. A Pathological Study of Experimental Meningitis from Subarachnoid Inoculation.* JAMES B. AYER. Monogr. Rockefeller Inst. M. Research, N. Y., No. 12, 1920, 26-44.

A study is here presented of the meningeal reaction experimentally produced by subarachnoid inoculation of a large number of microorganisms, correlating from the pathological point of view the experiments described in the first paper of this series.

On a pathological basis, meningitis may be classed as (a) aseptic, including all meningeal reactions of non-infectious origin, as seen in febrile states, following subarachnoid injection of serum and chemicals, etc., and (b) infections. All degrees of intensity and exudation are seen in each class.

The organisms used for subarachnoid inoculation were: streptococcus, *B. coli*, staphylococcus, *B. pyocyaneus*, *B. paratyphosus* B, *B. mucosus capsulatus*, meningococcus, *B. subtilis*, and *B. gallinarum*.

*Streptococcus*: This group was found to cause, for the most part, a low grade meningitis, though some strains had a moderate original virulence which could be raised on animal passage, causing on later inoculations, a massive exudative meningitis. Toxic filtrates from streptococcus cultures produced death on subarachnoid inoculation, with acute aseptic meningitis and toxic endarteritis.

*B. coli*: Members of this group usually produced a subacute or chronic meningitis, even in considerable numbers. Massive inoculations, however, sometimes produced acutely fatal infections; while sometimes markedly virulent for the meninges, *B. coli* is more likely to die out rapidly, leaving a residual chronic meningitis sometimes accompanied by destruction of nervous tissue.

*Staphylococcus*: Moderate subacute infections were usually obtained with this organism. Rarely was a massive meningitis produced.

*B. pyocyaneus*: Rather small doses frequently gave a massive purulent meningitis with fatal outcome, though this result was not always obtained. In acute cases with larger doses, where death occurred after more than 48 hours, the central nervous system appeared greenish-yellow throughout, with considerable mucopurulent exudate over the dura. Markings of brain and cord were frequently obliterated by massive exudate containing many organisms, and there was extensive invasion of ventricles, brain and cord and dura.

*B. paratyphosus* B: Possessed considerable virulence for the meninges, which could be increased by cat passage, 1 cc. of 1-10,000 dilution proving fatal on subarachnoid inoculation.

*B. mucosus capsulatus*: *B. lactis aerogenes* of this group was the most successful of all organisms employed. Meningitis was usually fatal within 48 hours, during which interval the exudate remained confined within the subarachnoid space. In cats dying after two days the generalized meningitis was more intense and tended to pass beyond the boundaries of the subarachnoid space, invading ventricles and central nervous tissue and showing many organisms present in the exudate, evidence of active proliferation.

*Meningococcus*: A strain producing acute purulent meningitis in rabbits was encountered late in the work. Animals usually died within 24 hours, showing a generalized purulent meningitis with considerable, sometimes massive, exudate of polymorphonuclear leucocytes, with numerous organisms.

*B. subtilis*: Acute exudative leptomeningitis and acute pachymeningitis was produced with exudate in the central canal. No organisms were seen, suggesting that virulence had become spent. The organism was not reliable in small dosage.

*B. gallinarum*: Failed to kill a cat receiving  $\frac{1}{2}$  of a 60-hour agar slant. Sections showed mononuclear cells, some containing pigment granules, in cerebral sulci and pockets formed by nerve roots with dura and nervous system. Ventricles dilated but otherwise normal. No organisms seen.

Aseptic meningitis was produced with chemicals such as chloramine and flavine, with bacterial filtrates, with whole blood and serum and with inert particles such as carbon granules, India ink and cinnabar. Acute meningitis resulted from the subarachnoid injection of autogenous, homologous or heterologous serum, with symptoms frequently present and pathological changes well marked. The meningeal reaction during the first few hours following injection of serum was sometimes rather more marked than that produced by virulent organisms, though by the following day the cell count in the spinal fluid had fallen, resembling the picture obtained with weakly virulent organisms.

The foregoing cases of experimental meningitis may be classified into three groups:

(a) Focal subacute meningitis. In this group the brain and cord appeared normal grossly but showed microscopic accumulations of lymphocytes, plasma cells and frequently large mononuclear phagocytes in pockets of the meninges, usually in the deeper layers of the *pia mater*. Organisms were rarely seen, cultures of blood and spinal fluid being usually negative, while death, if it occurred, could not be attributed to meningitis. Such reactions were obtained with some streptococci and with staphylococci and *B. coli*, and were encountered late after serum injections.

(b) Acute exudative meningitis of low grade type. Early in the infection the exudate was polymorphonuclear in character, but later became lymphocytic. It was never massive. Organisms were sometimes absent but were usually present in small numbers, an evidence of feeble viability. Death possibly due to meningitis but usually to causes outside the central nervous system. *B. pyocyaneus* and *B. coli* produced this type of reaction.

(c) Massive acute meningitis. Characterized by rapid proliferation within the meninges, even after minimal inoculations. Exudate throughout subarachnoid space and beyond, causing death in a few hours or days. In these cases blood infections were present. *B. pyocyaneus*, *B. coli*, *B. paratyphosus*, meningococci and streptococci gave this reaction inconsistently and only after animal passage. It was the rule with *B. lactis aerogenes*, even in very small doses.

After injection the organisms, in acute fulminating meningitis, spread rapidly throughout the subarachnoid space. In animals dying within 24 hours the site of injection could usually be located, but seldom after this time. In the first 24 hours the exudate was for the most part confined to the subarachnoid space, infiltration taking place also into the perivascular spaces, the cortical vessels in the brain and the central vessels in the cord showing, as a rule, the earliest and most marked involvement. In a few hours organisms appeared in the fourth ventricle and canal, and a little later in the third and lateral ventricles. Exudate appeared soon after. Invasion of the parenchyma rapidly occurred, usually by direct extension from the lateral ventricles and spinal canal. It might be in the nature of a rapid infiltration with organisms and polymorphonuclear leucocytes or, proceeding more slowly, leave complete destruction of nervous tissue in its path. Marginal infection was less frequent than the periventricular type and spread directly from the meninges. Small foci were rarely seen in brain and cord, and were probably secondary to infected blood vessels or perivascular spaces. Infection spread from the subarachnoid space along the paths of spinal nerves, attaining an epidural position about nerve roots and root ganglia.

Animals dying of meningitis seldom failed to show organisms in the blood vessels either microscopically or culturally. After 18 hours, septicemia was invariably present and probably played an important part in the fatal outcome, while in less acute forms of meningitis it was doubtless the primary cause of death.—I. W. P.

1516. *A Study of Experimental Meningitis. III. The Intrameningeal Virulence of Microorganisms.* LLOYD D. FELTON. Monogr. Rockefeller Inst. M. Research, N. Y., No. 12, 1920, 45-56.

A method is here presented for enhancing the original intrameningeal virulence of strains of *B. mucosus capsulatus*, hemolytic streptococcus, meningococcus and *B. paratyphosus*. The work was undertaken to maintain virulence so that the production of an experimental meningitis could be standardized and to make possible further investigation of the factors favoring infection of the meninges from the blood stream.

*B. mucosus capsulatus* (*B. lactis aerogenes*). Virulence was maintained over a period of several months on artificial media without any precautions being taken, but suddenly fell off. Attempts to restore the lost virulence were promptly made. Intravenous injection in cats raised the virulence somewhat for injections by this route, but failed to increase meningeal virulence. Subarachnoid injection was then resorted to, injections of organisms and withdrawal of spinal fluid being performed aseptically through the occipito-atlantoid ligament, the needle entering the *cisterna magna*. Cultures taken in this way at autopsy in cat brain or cat blood broth were incubated 18 hours and injected into the subarachnoid space in other animals. It was found by these two methods that intravenous virulence was increased not more than 5 times, while intrameningeal virulence was increased 50,000,000 times.

*B. paratyphosus B* (cats). The strain chosen possessed a certain degree of natural virulence for the meninges of the cat. After passage the relative increase in intravenous and intrameningeal virulence was as 1-5,000.

*Meningococcus* (rabbits). Cultures were made at autopsy into unheated defibrinated rabbit blood diluted 1-3 parts with Locke's solution, and were incubated 18-24 hours before new subarachnoid injection. Intravenous and intrameningeal virulence of the strain at the time of its greatest activity was as 1-1000.

*Streptococcus* (cats). The original virulence for cats on intravenous or intrameningeal injection was very low. After passage through cats the intrameningeal virulence increased 5,000 times, the lethal intravenous dose being at least 2,000 times greater than the lethal intrameningeal dose.

*Hemolytic Streptococcus* (rabbits). Heart's blood was cultured at autopsy in acetic broth and incubated 18 hours before injection into another animal. Intraperitoneal, intravenous and intrameningeal injections were employed. Approximately the same degree of virulence was developed by both the intraperitoneal and intrameningeal routes. An error whereby one rabbit of the intrameningeal series was given the dose meant for a rabbit of the intraperitoneal series, and promptly succumbed to infection, suggests that the virulence of this strain of streptococcus is not a phenomenon of predilection for specific tissue. At the end of the experiment the intraperitoneal virulence was to the intravenous virulence as 400-1, while the intrameningeal virulence was to the intravenous as 200-1.

The fact that virulence by intraperitoneal or intrameningeal injection is greater than by intravenous injection is attributed to the fact that the defensive mechanism of the animal is largely contained within the circulating blood. The meninges and peritoneum, on the other hand, consist of mesothelium lined sacs serving as good incubators, furnishing to the bacteria sufficient nutriment and but slight inhibitory power. Invasion of the blood stream from the meninges in fatal cases suggests that the small intrameningeal or intraperitoneal doses are equivalent to the massive intravenous one.—I. W. P.

1517. *A Study of Experimental Meningitis. IV. The Influence of Certain Experimental Procedures upon the Production of Meningitis by Intravenous Inoculation.* LEWIS H. WEED, PAUL WEGEFORTH, JAMES B. AYER AND LLOYD D. FELTON. Monogr. Rockefeller Inst. M. Research, N. Y., No. 12, March 25, 1920.

*B. lactis aerogenes* was, of all the organisms investigated, the only one capable of producing meningitis in concentrations analogous to those causing similar infections in man. It was killed fairly quickly when injected into the blood stream, except when given in massive doses. When given into the subarachnoid space as few as 20 organisms, as determined by plating, were sufficient to cause death in cats, with the production of a typical meningitis.

Control cats receiving intravenously 0.5 cc. of a 24-hour culture of *B. lactis aerogenes* sometimes showed slight initial discomfort but recovered in a few hours and developed no meningitis. Cats receiving half the dose intravenously, followed in 2 minutes by withdrawal of 1.0 to 1.5 cc. of spinal fluid, usually began to show excitability or slowness of movement and signs of meningeal irritation within 24 hours, hyperesthesia, convulsions and mania being encountered in different animals. Extensor spasms sometimes occurred spontaneously, and could sometimes be elicited by proper stimulation. The clinical picture of the rigidities was quite typical and wholly analogous to that occurring in man. Occasionally the stage of meningeal irritation was lacking, death supervening after an initial stage of weakness. Death ensued regularly in from 16 to 120 hours, and usually in 24-48 hours. At autopsy the heart's blood was always positive for *B. lactis aerogenes*.

Identical pathological pictures of meningeal involvement in cats obtained by occipito-atlantoid and by lumbar puncture at the height of an experimental bacteremia. Rats, rabbits, guinea pigs and monkeys were also susceptible to meningitis following spinal puncture during a bacteremia. The production of meningitis with *B. pyocyaneus*, *B. paratyphosus*, streptococci and meningococci, following experimental blood infection, was also facilitated by release of spinal fluid. Release of cerebrospinal fluid less than half an hour before a sublethal intravenous injection of *B. lactis aerogenes*, and as much as 5 hours after such injection, usually produced a typical meningitis. Localization of the infection within the meninges occurred very quickly after the withdrawal of spinal fluid, animals killed one hour after spinal puncture showing organisms in the subarachnoid space.

It was indicated that replacement of the cerebrospinal fluid with an equal volume of Ringer's solution, before intravenous injection of organisms, prevented the development of a meningitis, while if the fluid was withdrawn and the lowered intracranial pressure maintained for 2 minutes at the height of the bacteremia before replacement with Ringer's solution, meningitis developed. These findings, and the fact that in most cases the spinal fluid remained sterile for a short time following puncture, suggested that infection of the meninges did not take place along the path of the puncture needle as a direct extension of the general blood infection from the capillaries ruptured during this operation. Mere puncture of the dura, without withdrawal of fluid, produced meningitis, probably because of leakage of spinal fluid into the tissues, through the puncture hole, and consequent lowering of intracranial pressure.

The type of meningitis caused by spinal puncture during a bacteremia differed from that produced by direct subdural injection of organism in that the infective process was largely cerebral, while in subdural infections the focus spread out from the point of injection, involv-

ing the cord first and the brain only secondarily. This further suggested that the meningitis caused by withdrawal of spinal fluid during a bacteremia was not a result of local infection from the puncture hole but was the result of a general infection. The lowering of intracranial pressure during the experimental bacteremia was thought to be the cause of the resulting meningitis.

Intracranial nervous congestion caused by compression of the jugulars for 2 minutes after intravenous inoculation of *B. lactis aerogenes* produced meningitis in about 50 per cent of the animals so treated, the controls remaining normal. The development of meningitis following such compression was slower than that following the withdrawal of spinal fluid, indicating that the number of organisms thus localized within the meninges was smaller.

Stopping of the heart beat for 30 seconds after blood infection, by overdoses of inspired ether produced fatal meningitis in about 50 per cent of the animals so treated. These findings lend weight to the hypothesis that meningitis is facilitated by slowing of the blood flow through the cranium. A fulminating type of infection was usually encountered in these cases.

Intravenous injections of hypertonic solutions of the common sodium salts (chloride, bicarbonate, sulfate) and of dextrose a few minutes before experimental blood infection, produced almost without exception a typical meningitis in the animals so treated, usually in a more severe form than that produced by spinal puncture. The injection of hypotonic solutions (distilled water) failed to produce meningitis. These experiments further suggest that the spread of infection from the blood to the meninges is facilitated by the temporary lowering of intracranial pressure.

Subarachnoid injection of autologous, homologous and heterologous sera, with the consequent production of an aseptic meningitis, facilitated in a small proportion of cases (6 out of 39) injection of the meninges from the blood stream. This method was by no means so invariable as the others described above.

Meningitis could be produced inconstantly in cats by massive intravenous doses of *B. lactis aerogenes*, though death in these cases was usually due to toxemia. When extensive involvement of the meninges did occur, it was merely part of a generalized infection of all the body tissues and could not be considered as the selective localization of the bacteria due to a particular virulence for any particular tissues.—I. W. P.

1518. *A Study of Experimental Meningitis. V. Experimental Acute Hematogenous Meningitis. A Pathological Study.* JAMES B. AYER. Monogr. Rockefeller Inst. M. Research, N. Y., No. 12, March 25, 1920.

A report is made of the pathological findings in 109 animals, representing approximately 50 per cent of the cases upon which are based the experimental deductions of the foregoing chapter of this series. The study was made with a number of points in view: (a) To make a diagnosis; (b) to determine, if possible, the point of entry of organisms into the meninges; (c) to trace the spread of the meningitis; (d) to note any other matter of pathological interest.

Five different organisms were used successfully in this work, a fulminating type of meningitis being obtained with *B. lactis aerogenes*, meningococcus and *Streptococcus hemolyticus*, while with *B. pyocyaneus* and *B. paratyphosus* B a mild acute type was observed.

With *B. lactis aerogenes* in cats, and with a strain of hemolytic streptococcus and one of meningococcus in rabbits, there was produced, following intravenous injection of organisms with subsequent release of spinal fluid, jugular compression or injection of hypertonic solutions, a massive exudative meningitis appearing earliest in the cerebrum, especially over the cortex. Brain and cord markings were often flattened or obliterated and free blood was sometimes encountered in the subarachnoid space. Invasion of the perivascular spaces and of the molecular zone of the cortex by polymorphonuclear leucocytes was noted even in animals dying in 24 hours, while at the same time the fibropurulent exudate contained large numbers of organisms. Invasion of the central gray matter of the cervical cord was also noted, but at this stage the ventricles either appeared normal or showed only the earliest signs of involvement. In animals living 2 to 3 days the ventricles usually contained pus and, as a rule, the brain and cord tissue were more or less involved. In fatal cases the blood vessels were engorged and contained bacteria.

With *B. pyocyaneus* and *B. paratyphosus* B, a mild acute meningitis was obtained by the same methods. Few bacilli were found in such cases and while frank meningitis was present, it differed fundamentally from the pathological viewpoint from the fulminating type described above. A moderate infiltration of the subarachnoid space and of the perivascular spaces with large mononuclear cells was observed, while the meningeal reaction was patchy in character, tending to settle in convolution irregularities and about nerve roots. Death was not due primarily to meningitis, but probably to the accompanying septicemia.

Meningitis could be produced inconstantly by intravenous injection alone, without facilitating measures, but usually only when large doses were used.

Animals that failed to develop meningitis, as well as those in which meningitis occurred, showed visceral lesions following injections of *B. lactis aerogenes*, the organism most commonly employed.

(a) Kidney.—Cloudy swelling of the epithelium, with degeneration of its cells and filling of the lumina with epithelial exudate and blood elements. In severe cases, general acute congestion and small hemorrhages were encountered. (b) Liver.—Congested, the

cells swollen and poorly staining. (c) Spleen and pancreas.—Acute congestion. (d) Adrenal.—Sometimes degeneration of the cells in cortex and medulla. (e) Lung.—Sometimes appeared normal, but often congested. Frequently showed free blood and exudate in the alveoli, and in longer cases a true bronchopneumonia.

Death probably depended partly upon these marked visceral lesions.

The earliest lesions were invariably seen in the cerebral subarachnoid space, but the infection spread rapidly. Up to 24 hours it was usually possible to see a difference in the involvement of brain and cord, with a preponderance of exudate over the brain, but by 48 hours the exudate was universally massive. Infection of the ventricles and central canal usually took place early; the fourth ventricle and central canal were thought to be involved first, followed in order by the third and lateral ventricles. When the ventricles were involved, the parietal ependyma often appeared elevated and broken, while bacilli could be seen in the loose subependymal meshwork. When ventricular infection existed, the velum was uniformly infiltrated with exudate, though the choroid plexus might appear normal. Soon, however, the choroidal vessels became engorged, the stroma showed polymorphonuclear infiltration and the choroidal ependyma became distended, but were with well developed ventricular infection. No break appeared in the choroid nor were organisms usually observed outside its vessels. Later the choroid and the ventricular walls frequently became involved in an intense purulent process.

Early ventricular infection was accompanied by early invasion of the central nervous system, usually about the lateral ventricle. In the cord, vertical levels were attacked first, the process commencing either from the canal or immediately subjacent, with organisms and polymorphonuclear leucocytes spreading first into the central gray matter and thence usually posteriorly into the white matter and laterally into the gray. Focal infections of the nervous system also occurred, especially in the gray matter, suggesting invasion from vessels and perivascular spaces. Occasionally direct invasion from the pia occurred, but such marginal infection was encountered so rarely as to suggest that it was usually prevented by protective factors in the arachnoid, pia and cortex. Hemorrhages were occasionally encountered, usually in the gray matter of the cord. The nerve cells were affected surprisingly little, even with invasion of the gray matter.

Extension of the infection outward from the subarachnoid space occurred by direct spread to the inner side of the dura and more frequently where the dura is "pierced" by the nerve roots. At the root zones small amounts of exudate sometimes appeared even on the external surface of the dura.

Phagocytosis of the invading organism was almost never observed in smears from the spinal exudate of fulminating cases, but in cases running a more chronic course phagocytosis by the cells of the spinal fluid was noted.—I. W. P.

*1519. Studies on Experimental Pneumonia. I. Production of Pneumococcus Lobar Pneumonia in Monkeys.* F. G. BLAKE AND R. L. CECIL. J. Exper. M., N. Y., 1920, 31, 403-443.

The first paper presents the results of the experimental production of lobar pneumonia in monkeys (*Macacus syrichtus* and *Cebus capucinus*), by means of highly virulent strains of each of the 4 types of pneumococcus.

Virulent pneumococci were injected intratracheally, by inserting a small caliber, dry, sterile needle into the lumen of the trachea between the tracheal cartilages just below the larynx and introducing the cultures by means of a Luer syringe directly into the trachea, in doses varying from 0.000001 to 1 cc. but diluted to a final fluid content of 1 cc. Among 37 monkeys, 32 developed lobar pneumonia in all respects resembling the disease as seen in man, with characteristic sudden onset, sometimes with chill, abrupt rise in temperature, rapid labored respirations, cough, physical signs of consolidation, early polymorphonuclear leucocytosis, and in those cases which recovered, drop in temperature by crisis. Twenty-one of the 26 cases of pneumococcus Type I lobar pneumonia died, but the 6 cases of Type II, Type III and Type IV recovered.

It was noted that early in the disease a leucocytosis was present, often before clinical evidence of pneumonia or elevation of temperature had occurred, and was doubtless an immediate response of the host to combat the infection at the point of entrance by an extensive infiltration of polymorphonuclear leucocytes in the peribronchial tissues and even extrusion into the lumen of the bronchi. Following the preliminary rise there would be a constant fall in the curve of leucocytes, the rapidity and extent of this fall bearing a direct relation to the severity of the disease. Stained blood films showed that during the fall mature polymorphonuclear leucocytes were increasingly replaced with young forms with 2 or 3 nuclear lobules. In severe cases with overwhelming septicemia and leucopenia the mature leucocytes entirely disappeared and occasional myelocytes, normoblasts and polychromatophilic cells were seen. This would indicate, therefore, an initial intense stimulation of the bone marrow followed by a progressive exhaustion as the severity of the infection increased.

One case of contact Type I pneumococcus lobar pneumonia was produced. During a period of one month 4 monkeys suffering from experimentally produced Type I pneumococcus pneumonia were placed in the cage with 6 normal animals, one of whom contracted a Type I pneumonia.

Attempts to produce a Type I lobar pneumonia by spraying large doses (2-4 cc.) of highly virulent Type I pneumococci into the noses and throats of 4 monkeys entirely failed, in spite of the fact that in 3 of these cases the organisms persisted in the mouth for a month after

inoculation. From this observation it would seem that a virulent pneumococcus is incapable of initiating an infection of the normal upper respiratory tract in a highly susceptible animal. The factors which determine whether or not a virulent pneumococcus in the upper respiratory tract will gain access to the bronchi are unknown.

Similarly intravenous injections in 5 monkeys and subcutaneous injections in 4 monkeys of 0.01 to 0.001 cc. of this same strain of Type I pneumococcus failed to exhibit any tendency to localize in the lungs, or develop any symptoms characteristic of lobar pneumonia, but produced only a pneumococcus septicemia.

Control experiments with intratracheal injections of sterile broth, killed pneumococci and living avirulent pneumococci, likewise did not cause any pulmonary infection.

The constant production of lobar pneumonia in monkeys by means of intratracheal injection of virulent pneumococci and the constant failure to produce it by other methods of inoculation are believed by the authors to be conclusive evidence that infection is bronchiogenic rather than hematogenous in origin, and that invasion of the blood stream is secondary to infection of the lungs.—W. P. B.

**1520. Studies on Experimental Pneumonia. II. Pathology and Pathogenesis of Pneumococcus Lobar Pneumonia in Monkeys.** F. G. BLAKE AND R. L. CECIL. J. Exper. M., N. Y., 1920, 31, 445-474.

The authors present the results of both gross and microscopic study of the lungs of 40 cases of pneumococcus lobar pneumonia in monkeys, produced by intratracheal injections of virulent pneumococci, as described in the preceding paper (q. v.). The gross and microscopic lesions of all stages of the disease from early engorgement, through red and gray hepatization to resolution and organisation, are described in detail, accompanied by illustrative protocols, and 23 photographs and drawings.

It is shown that the pneumococcus primarily invades the pulmonary tissue at some point or points in the portion of the lobe proximal to the hilum, probably by direct penetration of the walls of the larger bronchi rather than by way of the terminal bronchioles, alveolar ducts or alveoli near the hilum. The initial lesions of lobar pneumonia are of the interstitial framework of the lung adjacent to the hilum, spreading by way of the perivascular, peribronchial and septal tissues and lymphatics, and invading the alveolar structure primarily by way of the alveolar walls, subsequently passing into the alveolar spaces simultaneously with the outpouring of exudate into the alveoli. Hepatization begins centrally and spreads progressively toward the periphery. Resolution is frequently accompanied by a varying degree of organisation in the perivascular and peribronchial tissues, and occasionally by a patchy organisation of the alveolar exudate.—W. P. B.

**1521. Experimental Syphilis in the Rabbit. I. Primary Infection in the Testicle.** W. H. BROWN AND L. PEARCE. J. Exper. M., N. Y., 1920, 31, 475-498.

The paper describes the gross clinical characteristics of the testicles of rabbits experimentally infected with strains of *Treponema pallidum*, which had been carried in the testicles of rabbits for several years, and correlates the clinical findings in different stages with the dark field examination of the spirochetes. The paper is illustrated with 37 photographs.

It was found that the incubation period varied between 2 and 6 weeks. The resulting infection pursued a cyclic or relapsing course such as has been noted in other spirochetal infections. In certain animals the reaction was characterised by an intense cycle of acute exudation and infiltration with a lesser degree of proliferation, the infiltration involving diffusely the testicle, tunic, epididymis and cord. This stage was preceded and accompanied by a rapid increase in the numbers of actively motile spirochetes, and was followed by crisis, at which time the spirochetes began to lose their motility and collected in tangled masses, and the testicular lesions rapidly subsided. This was succeeded by a variable period of inactivity when the spirochetes either entirely disappeared or the few seen were degenerated or slightly motile; and then the cycle was repeated. In another group of animals the reaction was more chronic in character, infiltrative and proliferative in type and the remissions were slight and irregular.

The duration of the process was very variable, in some consisting of but a single sharp cycle, terminating by crisis within 4-6 weeks. The average periods of active infection was from 2-4 months, although inactive or quiescent lesions often lasted for from 4-6 months, in exceptional instances more than a year.—W. P. B.

**1522. Experiments on the Nasal Route of Infection in Poliomyelitis.** S. FLEXNER AND H. L. AMOSS. J. Exper. M., N. Y., 1920, 31, 123.

Pledgets of cotton impregnated with active poliomyelitis virus extracted from the spinal cord and medulla of a monkey with acute experimental poliomyelitis were inserted into the nares of monkeys and allowed to remain for three or more hours. In 40-60 hours thereafter the monkeys were killed, the nasal mucosa excised, ground and suspended in saline and injected intracerebrally and intraperitoneally into other monkeys. Some of these latter monkeys developed poliomyelitis and died, indicating that the virus remained active on the nasal membrane of the first monkeys at least 60 hours, but in other animals no symptoms developed, which would indicate that in these cases the nasal mucous membrane possessed [the power of destroying or eliminating the virus so energetically applied to it. Similar experiments in which not only suspensions of the nasal mucous membrane, but also of the olfactory lobes,



postrolandic convolutions, medulla, and cervical and lumbar spinal cord were inoculated separately into the brains of other monkeys frequently failed to produce infection, not only in cases where the cotton pledgets carrying the virus had been applied to the nasal mucosa for 2 hours, but also for longer periods, whereas other monkeys succumbed to poliomyelitis on the same exposure.

Chloramine-T and the oily solution of dichloramine-T, repeatedly applied to the nasal membrane both before and after exposure to the virus failed to prevent the development of the infection in two experiments described, and the question was raised as to whether these antiseptics might not even be objectionable in affecting unfavorably the destructive property of the nasal mucosa.

Earlier experiments by these authors had indicated that the meningeal-choroidal plexus acted as a defensive barrier against the virus, but that this might be rendered ineffective if disturbed by a temporary chemical inflammation, such as could be produced by irritation with horse serum injected intraspinally. 1 cc. of horse serum injected intraspinally, followed the next day by insertion of a virus tampon in the nares, resulted in infection of the monkey. This was not prevented by large doses of hexamethyleneamine by stomach tube, but was prevented by 10 cc. of pooled monkey poliomyelitic serum intravenously. Therefore even under highly favorable conditions of susceptibility, the infection of these monkeys could be prevented by passive immunization by way of the blood stream, thus blocking the passage of the virus from the nasal mucosa to the central nervous tissue. The authors believe this blocking by the immune serum takes place in the subarachnoid space rather than in the blood.—W. P. B.

1523. *De la pathogénie du choléra. (Deuxième mémoire.) La "peritonite cholérique" du cobaye. (The Pathogenesis of Cholera. II. "Cholera-peritonitis" of the Guinea Pig.)* G. SANA-RELLI. Ann. de l'Inst. Pasteur, Par., 1920, 34, 271-284.

Protocols are presented showing that guinea pigs, injected intraperitoneally with a culture of the cholera vibrio, succumb to the infection at a time when the action of phagocytes has almost entirely removed the vibrios from the peritoneum. Blood cultures show that there is a severe vibriolemia 5 minutes after the injection of the cholera organisms into the animal's peritoneum. The bacteremia decreases somewhat after the first hour, but continues until the death of the guinea pig. The cause of death is apparently not the liberation of cholera endotoxin by the destruction of vibrios in the peritoneal cavity, but is related to the septi-cemia.—S. B-J.

#### CHEMOTHERAPY

(See also Number 1450)

1524. *The Liberation of Formaldehyde from and Decomposition of Anhydromethylenecitric Acid and Its Excretion in Urine with Comments on "Citarin" and "Helmitol."* P. J. HANZLIK. J. Urology, Balt., 1920, 4, 145-167.

An investigation was undertaken to determine more exactly the behavior of anhydromethylenecitric acid in alkaline medium with particular reference to its excretion in urine and the conditions under which formaldehyde is liberated with a similar study of "citarin" its sodium salt and "helmitol" the hexamethyleneamine anhydromethylene citrate.

He concludes that the alkalinity of a deci-normal sodium hydrate solution of pH 13.06 is necessary for the liberation of formaldehyde which is higher than the most ammoniacal urine. He also states that urines decompose readily with no apparent antiseptic properties when the acid has been given in conjunction with bicarbonate. The action of "citarin" and "helmitol" are negligible as a urinary antiseptic, hexamethyleneamine being far superior.—R. D. H.

#### MISCELLANEOUS

1525. *Der Parasitismus als schöpferisches Princip. (Parasitism as a Creative Principle.)* R. H. FRANCÉ. Centralbl. f. Bakteriologie (etc.), Jena, 2. Abt., 1920, 50, 54-64.

Parasitism is considered as one of the most important factors in the evolution of living nature. The parasitic manner of life is not a step backward in the development of the organism, not a recession from the normal manner of nutrition, but it is an acquisition of a favorable condition, which opens up for the organism new and unexpected possibilities of development.—S. A. W.

1526. *Über das Fehlen der Bromreaktion auf Tryptophan bei tryptisch verdaulichen Leukocyten. (The Failure of the Bromine Reaction for Tryptophane in Leucocytes Which Have Undergone Tryptic Digestion.)* MORIZ WEISS. Biochem. Ztschr., Berl., 1919, 98, 116-119.

Pus cells give a strong Adamkiewicz-Liebermann test. The color tint of this reaction in casein is blue, in the leucocytes, violet. In contrast to the reaction in casein, the leucocytes do not give any brom reaction characteristic for tryptophane. Pus which has undergone putrefaction, in contrast to casein, does not show more than traces of indol with the uro-sein test. It is therefore probable that in the structure of leucocytes tryptophane is not present, but some derivative of this compound.—R. E. B.

1527. *Über die Darstellung und einige Eigenschaften des pathologischen melanins.* (*The Appearance and Certain Properties of Pathological Melanin.*) E. SALKOWSKI. *Virchow's Arch. f. Path. Anat. (etc.)*, Berl., 1920, **227**, 121.

Boiling with strong sulphuric acid throws down an impurity, the so-called melanoidin. The last traces of albumin and fat may be demonstrated by heating with glacial acetic acid.

Melanin is composed of one part soluble and 15 per cent insoluble in solutions of caustic soda. After long preservation the soluble part becomes more or less insoluble. Melanin contains sulphur in strong combination. It is completely decomposed in an alkaline solution of potassium permanganate and a mixture of potassium bichromate and sulphuric acid.

—S. A. G.



DEC 30 1920

VOLUME IV

NUMBER 5

# ABSTRACTS OF BACTERIOLOGY

UNDER THE EDITORIAL DIRECTION OF THE  
SOCIETY OF AMERICAN BACTERIOLOGISTS

OCTOBER, 1920

EDITOR

A. PARKER HITCHENS



*It is characteristic of Science and Progress that they continually  
open new fields to our vision.—PASTEUR*

PUBLISHED BI-MONTHLY  
FOR THE SOCIETY OF AMERICAN BACTERIOLOGISTS BY  
WILLIAMS & WILKINS COMPANY  
BALTIMORE, U. S. A.

Entered as second-class matter April 30, 1917, at the Post-Office at Baltimore, Maryland,  
under the Act of March 3, 1879

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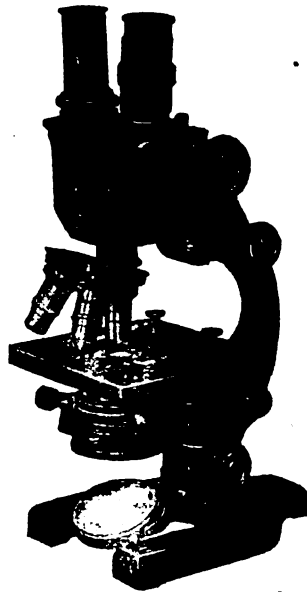
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## ABSTRACTS OF BACTERIOLOGICAL LITERATURE

### CHARACTERIZATION AND CLASSIFICATION

(See also Number 1595)

1528. *Classification of Streptococcus. I. Streptococci Isolated from Normal Throats, Classified by Sugar Fermentations.* LLOYD ARNOLD. J. Lab. & Clin. M., St. Louis, 1920, 5, 587-590.

In a study of 134 normal throats 50.74 per cent were found to contain hemolytic streptococci and 91 per cent nonhemolytic streptococci. One hundred and seventeen strains of hemolytic streptococci and 87 of nonhemolytic were classified by Holman's classification.—F. W. H.

1529. *Classification of Streptococcus. II. Streptococci Isolated from Influenza Throats, Classified by Sugar Fermentation.* LLOYD ARNOLD. J. Lab. & Clin. M., St. Louis, 1920, 5, 591-592.

The author found little difference in the types of streptococci isolated from throats during the influenza epidemic (1920) and those isolated from normal throats.—F. W. H.

1530. *Varieties of Streptococci with Special Reference to Constancy.* B. J. CLAWSON. J. Infect. Dis., Chicago, 1920, 26, 93-116.

This report of a prolonged study of 134 strains of hemolytic and 150 strains of non-hemolytic streptococci is the result of an investigation of the morphology, action on blood agar, fermentation of carbohydrates, agglutination and complement fixation reactions of these organisms. Pleomorphism and capsule formation varied in the same strains. Hemolysis was a constant characteristic, even after nearly two years of artificial cultivation. Of 134 strains of hemolytic streptococci, only 4 were slow fermenters of lactose, and only 3 failed to ferment salicin. Two of these strains fermented mannit.

The fermentation reactions of the non-hemolytic strains were more variable. Of the 150 strains studied, 5 always failed to ferment lactose, 36 always fermented mannit and 75 fermented salicin.

There was no relation between fermentation reactions and source or pathogenicity of the streptococci. In view of this, the validity of subgroups of non-hemolytic streptococci is questioned.

Agglutination and complement fixation reactions showed that the hemolytic group was homogeneous, while the non-hemolytic group was more heterogeneous.—S. B-J.

1531. *The Human Fecal Streptococci.* C. J. OPPENHEIM. J. Infect. Dis., Chicago, 1920, 26, 117-129.

From a study of 323 strains of streptococci isolated from the feces of normal adults, the author finds that mannit-fermenting non-hemolytic streptococci are the predominant type. Hemolytic streptococci are rarely present in the stools of normal persons. Stools from infants contain streptococci, less numerous than those of adults, but like the organisms from adults in fermentation and morphological types.

The effect of various media upon the ability of streptococci to ferment carbohydrates is described. The amount of acid produced depends upon the composition of the medium and its original reaction, as well as upon the length of the period of incubation.—S. B-J.

1532. *Biologic Studies of the Diphtheria Bacillus.* L. C. HAVENS. J. Infect. Dis., Chicago, 1920, 26, 388-401.

The morphology of the diphtheria bacillus varies so greatly that no information as to its virulence can be obtained from its staining reactions. Some of the solid forms are virulent, while some of the granular forms are not virulent.

By agglutination reactions two groups of the diphtheria bacillus were obtained. The first group contained 82 per cent of the 206 strains studied. The "Park No. 8 strain" was included in this group. The members of the two groups showed no characteristic differences in morphology or in relative virulence.

It was found, however, that antitoxin prepared by immunising horses against toxin from organisms of Group I was much less protective against Group II toxin. Group antitoxins were found only in small amounts common to both groups.

It is suggested that "the effectiveness of therapeutic antitoxin could be enhanced by inclusion in its production of a member of the second or smaller group."—S. B-J.

1533. *The Differentiation of the Paratyphoid-Enteritidis Group. VII. Irregular and Variable Strains.* E. O. JORDAN. J. Infect. Dis., Chicago, 1920, 26, 427-434.

The history of several strains of the paratyphoid-enteritidis-suispestifer group of bacteria is recorded to show that variations both in nature and in artificial test tube cultures are very

common to these organisms. These variations affect agglutination and fermentation characters. Certain fundamental qualities, like the inability of *B. paratyphosus* A to attack xylose, and the ability of the whole group to ferment dextrose are rarely subject to variation, suggesting that such characteristics are more fundamental than agglutination reactions.—S. B-J.

1534. *Ueber einige den Tuberkelbazillen verwandte säurefeste Saprophyten.* (Some Acid-fast Saprophytes Related to the Tubercle Bacillus.) BRUNO LANGE. Deutsche med. Wchnschr., 1920, 46, 763-764.

The author made a comparative study of the acid-fast organisms morphologically similar to the tubercle bacillus found in soil, water, and in cold-blooded animals like the turtle, frog and fish. These various organisms could not be differentiated from each other morphologically nor culturally. They were all strongly acid- and alkali-fast, Gram-positive and non-motile. Growth took place on all ordinary media, but better on those containing glycerine. Their viability corresponds with that of the tubercle bacillus; in nature, they remain alive very long if sufficient moisture be present.

Injection of these organisms into animals produces reactions that appear macroscopically like those of tuberculosis, but actual multiplication in the tissues of mammals has not been shown. Immunisation experiments with these organisms against tuberculosis have resulted in a slight retardation of the disease to the same degree as that produced by use of the Friedmann organism. Qualitatively and quantitatively, all these acid-fast saprophytes are identical.—B. C.

#### NEW SPECIES

(See also Numbers 1576, 1600, 1618, 1625, 1629, 1637, 1640, 1657)

1535. *Botanische Untersuchung einiger neuer Bakterienspezies, welche mit reiner Harnsäure oder Hippursäure als alleinigen organischen Nährstoff auskommen.* (Botanical Investigation of Several New Bacteria, Which Are Able to Develop with Pure Uric or Hippuric Acid as the Only Organic Nutrient.) C. STAPP. Centralbl. f. Bakteriologie (etc.), Jena, 2. Abt., 1920, 51, 1-71.

This is an extensive study of the morphology and physiology of a series of spore-forming bacteria isolated from fecal residue which are able to derive their nitrogen and carbon from uric and hippuric acids. The characteristic facts are presented in detail in tabular form. Particular emphasis is laid upon the fact that systematic bacteriology is only possible when accurate monographic treatment of bacterial species is presented.—S. A. W.

1536. *Ueber eine der Weilschen Spirochäte ähnliche Zahnspirochäte des Menschen (Spir. trimero-donta) und andere Mundspirochäten.* (A Dental Spirochete of Man (Spir. trimero-donta) Similar to Weil's Spirochete, and Other Oral Spirochetes.) ERICH HOFFMANN. Deutsche med. Wchnschr., 1920, 46, 257-259; 625-626.

A description of certain oral spirochetes is given, one of which, *Sp. trimero-donta*, is morphologically very similar to *Sp. icteroides* Weil. The following morphological classification of oral spirochetes is suggested:

- |  |         |             |
|--|---------|-------------|
| 1. <i>Spir. buccalis</i> (Cohn)                          | } ..... | Plump forms |
| a. <i>crassa</i>   |         |             |
| b. <i>tenuis</i>   |         |             |
| c. <i>inaequalis</i> (?)                                 |         |             |
| 2. <i>Spir. media oris</i> (E. Hoffmann and v. Prowazek) | .....   | Medium form |
| 3. <i>Spir. dentium</i> (Koch) (ev. <i>orthodonta</i> )  | } ..... | Fine forms  |
| 4. <i>Spir. skoli-donta</i>                              |         |             |
| 5. <i>Spir. trimero-donta</i>                            |         |             |

In the later communication, the author recognizes the work of Noguchi in 1918 in this field, and if the latter's mode of classification be accepted, then the new organism should be named, not *Spirochaeta trimero-donta*, but *Leptospira dentium*.—B. C.

1537. *Glaridacris Catostomi* Gen. Nov., Sp. Nov., A Cestodarian Parasite. A. R. COOPER. Tr. Am. Mic. Soc., Menasha. 1920, 39, 5-24.

A detailed description of a parasite found in the stomach and intestine of *Catostomus commersonii* found at the Douglas Lake Biological Station of the University of Michigan.—J. H. B.

#### BACTERIAL NUTRITION AND METABOLISM

1538. *Ueber einige Milchsäurebakteriologische pH Bestimmungen.* (The Determination of a Few Lactic Acid Bacteriological pH Values.) OLAF SVANBERG. Inaug. Diss. 4°. Stockholm. 1918, 81 pp.

The electrometric method was used for the determination of H' and OH' concentrations. The following subjects were investigated: (1) the ability of *Streptococcus lactis* and *Bacterium casei* to produce acid; (2) the acid tolerance of lactic acid bacteria; (3) the alkali tolerance of lactic acid bacteria, whereby a new lactic acid streptococcus was isolated from pressed yeasts and described; (4) the action of sodium lactate on lactic acid fermentation; (5) acid production by *Bacterium delbrücki*.

The results are as follows:

1. Acidity produced in milk and whey by *Streptococcus lactis* (*Bacterium lactis acidii*) corresponds to the value pH = 4, while *Bacterium casei* (*Bacterium lactis acidii*) in milk (and wort) to pH = 3.

2. The different properties for acid production of the two classes of bacteria do not depend essentially upon any different acid tolerance of the living cells, since both are checked by HCl and  $H_2PO_4$  at the same H-ion concentration, namely pH = 3.1-3.4.

3. By inoculating milk acidified with HCl,  $H_2SO_4$  and  $H_3PO_4$ , then inoculating with *Streptococcus lactis*, pH values down to 3.60 were obtained, while *Bacterium casei* never acidified below pH = 2.98, which is to be considered as the limiting acidity of the enzyme complex.

4. Both bacteria differ essentially from one another in their relation to lactic and acetic acids, to which *Streptococcus lactis* is particularly sensitive (lactic acid checked growth in milk at pH = 4.4-4.7 and acetic acid at 4.8-5.1). Lactic acid produced only a decided weakening action upon the enzyme formation of *Bacterium casei*, while acetic acid was more toxic and prevented the development of the microorganisms in milk at pH = 3.9.

5. The alkali tolerance in *Streptococcus lactis* and *Bacterium casei* is very small, since the first could be subdued by an alkalinity tolerated by cultivated yeast (pH = 7.9), while *Bact. casei* was unable to develop even at a neutral reaction (pH = 7.1).

6. The new class of alkali-tolerant lactic acid streptococci found in pressed yeasts corresponds, in milk and gelatin cultures, to the true lactococci in all essential properties. Only the race is somewhat more sensitive to H-ions than the milk bacteria; it soured milk to pH = 4.4; both did not grow at pH 4.8-4.9.

7. The undissociated lactic acid molecule has an important influence in checking fermentation of all lactic acid bacteria. The enzyme-protoplasm complex resists, in various microorganisms, the following HM-concentrations: *Bacterium casei* 0.1 N, *Streptococcus lactis* 0.01 N and *Bacterium coli* 0.001 N.

8. "Cultivated lactic acid bacilli" of various origin (*Bact. delbrückii*) bring about in wort the same acidity (pH = 3) as *Bacterium casei* on proper substrata. (Ref. Centralbl. f. Bakteriol. (etc.), Jena, 2. Abt., 1920, 51, 421-423.)—S. A. W.

1539. *Über die Wachstumsgeschwindigkeit der Milchsäurebakterien bei verschiedenen H-Konzentrationen.* (The Velocity of Growth of the Lactic Acid Bacteria, at Different H-Concentrations.) OLAF SVANBERG. Ztschr. f. physiol. Chem., Strassb., 1919, 108, 120-146.

These experiments were conducted with the purpose of determining the optimum pH conditions for the growth of the various races of true lactic acid bacteria, since these vary greatly as do also the characteristic enzymatic activities of microorganisms.

All experiments were carried out in 50 cc. Erlenmeyer flasks containing 30 cc. of substratum, closed with cotton plugs and sterilized by boiling for half an hour in steam on 2 consecutive days. The skimmed milk (pH = 6.5) was freshly obtained from the Milk Central Laboratory in Stockholm. The milk containing HCl (10 cc. 4 N HCl added to 1 L. of milk will give a pH of 4.6, the optimum for the precipitation of casein) was boiled for  $\frac{1}{2}$  hour in steam, filtered through cotton, then made alkaline to litmus by means of  $\frac{2}{N}$  NaOH, again warmed and filtered clear from the precipitated Ca-phosphate. The titratable acidity was obtained by titrating with 0.204 N NaOH with phenolphthalein as an indicator. In the cultural experiments, a mixture of  $KH_2PO_4$  and  $Na_2HPO_4$  (+  $12H_2O$ ) were used as regulators. The numbers of bacteria present was obtained by direct microscopic count.

Several races of true lactic acid bacteria, lactococci as well as lactobacilli, from various sources were used in the experiments on growth, at the same phosphate concentration, but with varying acidity. The most important results obtained were as follows: *Streptococcus lactis* from milk has a flat optimum between pH = 5.5 and pH = 6.4; at pH = 6.5-6.8, there is a rapid fall in the velocity of growth. *Bacterium casei* has a drawn-out optimum between pH = 5 and pH = 6; a sharp fall in the velocity of growth takes place at pH = 6-6.4. Almost the same conditions are true for the growth of *Bacterium delbrückii*.

The optimum of lactococci approaches the reaction of cow's milk (pH = 6.5), but they are still able to multiply and turn the substratum gradually acid at pH = 7-7.5-8.

The greater acid requirements for the lactobacilli explains the stimulating action of the lactococci, rapidly developing at the natural reaction of the milk, upon the development of lactic acid bacilli, as, for example, in Yoghurt and cheese. (Ref. Centralbl. f. Bakteriol. (etc.), Jena, 2. Abt., 1920, 51, 421.)—S. A. W.

1540. *The Metabolism of Virulent Human Tubercle Bacilli. Studies in Acid-fast Bacteria.* XI. A. J. KENDALL, A. A. DAY AND A. W. WALKER. J. Infect. Dis., Chicago, 1920, 26, 45-51.

The reaction of the medium, ammonia, amino nitrogen, total nitrogen, esterase and lipase were studied in parallel cultures of virulent human tubercle bacilli in glycerol broth during a period of 8 weeks. The noteworthy chemical features were the production of a feebly acid reaction, together with a gradual decrease in ammonia, amino nitrogen and total nitrogen in solution up to the point of maximum development of the culture. Finally, when recessive changes occurred in the culture, the amino nitrogen became greater than in the original medium, suggesting that the autolytic process yields considerable amounts of nitrogenous substance, measurable by Sorensen's method of formol titration.

Glycerol exerts a sparing action for the protein constituents of the medium, and serves as an available source of energy for the human tubercle bacillus.—S. B-J.



1541. *The Metabolism of Bovine Tubercle Bacilli. Studies in Acid-fast Bacteria. XII.* A. I. KENDALL, A. A. DAY AND A. W. WALKER. J. Infect. Dis., Chicago, 1920, 26, 77-84.

The metabolism of 4 strains of bovine tubercle bacilli was studied. The three noteworthy features of the metabolism were: progressive alkaline reaction in the glycerol mediums, increase in ammonia (or deamination), and increase of amino acids. Glycerol does not act as a source of energy for the bovine tubercle bacillus, and the character of metabolism of this organism is distinctly proteolytic, in contrast to that of the human tubercle bacillus.—S. B-J.

1542. *The Fate of Streptococcus hemolyticus in the Gastro-Intestinal Canal.* D. J. DAVIS. J. Infect. Dis., Chicago, 1920, 26, 171-178.

Cultures from 53 specimens of feces of normal persons failed to reveal hemolytic streptococci, although many of these persons harbored such organisms in their tonsils or throats. Hemolytic streptococci were found only occasionally in the feces of rabbits. Rabbits were fed cultures of *S. hemolyticus* through a gastric tube. Occasionally virulent streptococci passed through the intestinal canal. Usually the organisms were killed by the gastric juice and neither survived in the intestine nor caused lesions of the intestinal wall.

When streptococci were mixed with human feces and placed in an incubator, the organisms died out within 24 to 72 hours.—S. B-J.

1543. *Some Factors Influencing the Final Hydrogen-ion Concentration in Bacterial Cultures with Special Reference to Streptococci.* H. JONES. J. Infect. Dis., Chicago, 1920, 26, 160-164.

Data are presented showing that the same organism in a carbohydrate medium will produce different final hydrogen-ion concentrations in accordance with variations in the original medium. No classification of organisms can be based upon final pH unless these factors are defined. The limiting hydrogen-ion concentration of an organism should be defined in terms of composition of the medium, the initial reaction, and other conditions favoring or hindering growth.—S. B-J.

1544. *The Limiting Hydrogen-Ion Concentration of Various Types of Pneumococci.* H. M. JONES. J. Infect. Dis., Chicago, 1920, 26, 435-440.

In glucose broth, of pH 7.0, pneumococci grow with difficulty and produce a final reaction of the medium which varies from pH 5.6 to pH 7. Contrasted with this is the abundant growth of pneumococci in glucose broth adjusted to pH 7.6, in which the organisms regularly produce a final pH between the limits of 5 to 5.6. In this respect the final pH of pneumococci is no different from that of *Streptococcus hemolyticus*.

Growth of the pneumococcus was initiated with one strain in glucose broth with an initial reaction of pH 6.8.

Blood or ascitic fluid in broth cultures stimulates growth and increases the tolerance of the pneumococcus for the toxic hydrogen-ion.

It is again emphasized that in tests of final pH of an organism the initial reaction of the medium must be suitable for abundant growth and that there should be present an excess of the carbohydrate which the given strain metabolizes.—S. B-J.

1545. *Variations in the Hydrogen-Ion Concentration in Uninoculated Culture Medium.* L. G. GRACE AND F. HIGHBERGER. J. Infect. Dis., Chicago, 1920, 26, 457-462.

Meat extract broth and 1 per cent glucose broth were found to undergo changes during sterilization and on standing which influenced the reaction of the medium. Alkaline media became more acid, while some media of pH 6.4 became more alkaline after autoclaving, the change amounting to pH 0.6. Colorimetric methods, checked by the electrometric method, were used in the determination of the reaction. The experiments do not offer any evidence as to the cause of these changes of reaction.—S. B-J.

1546. *Acid Production by Streptococcus viridans in Mediums of Different Hydrogen-Ion Concentration.* L. G. GRACE AND F. HIGHBERGER. J. Infect. Dis., Chicago, 1920, 26, 451-456.

*Streptococcus viridans* grew equally well in 5 per cent ascitic fluid broth and 1 per cent glucose broth of initial pH 6.8 or 7.6. The initial reaction of pH 6.8 favored rapid growth, while media more alkaline than pH 7.6 retarded growth. In favorable media, *Streptococcus viridans* changed the reaction to pH 6.3 in 6 hours.

The cause of turbidity in broth cultures is discussed at length, the authors presuming that the precipitation of phosphates and other substances as the reaction becomes more acid is as essential a component of the turbidity as the bacterial bodies.—S. B-J.

1547. *The Action of B. typhosus on Xylose and Some of the Less Frequently Used Sugars.* O. TEAGUE AND K. MORISHIMA. J. Infect. Dis., Chicago, 1920, 26, 52-76.

The strains of *B. typhosus* which were said by the various observers who isolated them to be incapable of fermenting xylose were shown to be slow fermenters of this carbohydrate. By the selection of daughter colonies which produced acid on xylose plates, rapidly fermenting subcultures were obtained. Only a small percentage of the 115 typhoid strains studied produced acid in arabinose broth, and these did not do so constantly.

From the evidence of fermentation tests, the division of typhoid bacilli into separate groups is not justified.—S. B-J.

1548. *Phenol Red-China Blue as an Indicator in Fermentation Tests of Bacterial Cultures.* KAN-ICHIRO MORISHIMA. J. Infect. Dis., Chicago, 1920, 26, 43-44.

A 1 per cent solution of china blue in distilled water is decolorized with normal sodium hydroxide. The solution is kept hot on a water bath during the addition of the alkali. Usually 3.5 cc. of normal NaOH are required to decolorize 100 cc. of 1 per cent china blue. The alkali causes the blue color to change to brown. To the medium to be used are added 5 cc. of 0.02 per cent phenol red per 100 cc. of medium, and the reaction adjusted, usually to pH 7.2. Then 1.2 cc. of the decolorized china blue solution are added for each 100 cc. of the medium. If properly prepared, the medium is almost colorless.

The production of alkali in this medium causes the appearance of a red color, due to the phenol red; acid formation is indicated by first a green color and later by a deep blue.

These indicators are recommended for use in plating, in the place of Endo's fuchsin, as they do not change on exposure to light.—S. B-J.

1549. *The Selection of Sugars for Bacteriologic Work.* PETER MASUCCI AND GEORGE E. E'WE. J. Lab. & Clin. M., St. Louis, 1920, 5, 609-612.

The authors give tentative requirements which should be met by dextrose, lactose and inulin intended for bacteriological work.—F. W. H.

1550. *Les milieux semi-liquides pour la recherche et la culture des microbes anaérobies en médecine vétérinaire. (Semi-liquid Media for the Isolation and Cultivation of Anaerobic Microbes in Veterinary Medicine.)* J. LIGNIÈRES. Bull. Soc. centr. méd. vét., Par., 1919, 95, 353-356.

Lignières worked with the bacillus of Schmorl (cause of a severe contagious pneumonia of rabbits with necrotic lesions). Small percentages of agar are used with such substances as blood, serum, bile, litmus or the various sugars and results are favorable.—W. G.

1551. *Action du bacille fluorescent liquéfiant de Flüge sur l'asparagine en milieu chimiquement défini. Deuxième mémoire. Produits et mode de l'attaque de l'asparagine. (Action of B. fluorescens-liquefaciens of Flüge on Asparagin in a Chemically Defined Medium. II. Products and Mode of Attack of Asparagin.)* A. BLANCHETIÈRE. Ann. de l'Inst. Pasteur, Par., 1920, 34, 392-411.

The metabolism of *B. fluorescens-liquefaciens* in a synthetic medium containing asparagin was studied in the attempt to isolate all of the substances formed during the degradation of that amino acid, with particular reference to the mode of formation of fumaric acid. The analytical procedures are described in detail. The decomposition of asparagin by this organism is summarized as follows: By hydrolysis, asparagin is changed to ammonium aspartate; by oxidation and subsequent removal of  $\text{NH}_3$ , ammonium aspartate is changed to the enolic form of oxalacetic acid; from this, by various stages of reduction, fumaric, malic and succinic acids are formed; finally, by some process still unknown, fumaric, acetic and carbonic acids are produced from succinic acid.—S. B-J.

1552. *The Fermentation of Polysaccharides by Bacillus aerogenes.* R. L. LAYBOURN. J. Infect. Dis., Chicago, 1920, 26, 418-423.

One hundred and seventeen strains of *B. aerogenes* from various sources were used in a study of the fermentation of starches. Starches from a variety of vegetables, purified starches containing no reducing sugars, were fermented by about one-half of the strains of *B. aerogenes*, acid and gas being usually produced. The other strains affected various starches differently. But no correlation was apparent between the fermentation of these polysaccharides and the sources (soil, grain, sewage, etc.) from which the strains were derived. The starches were of no value in the differentiation of strains of the aerogenes group.

The products formed from starch by fermentation with *B. aerogenes* were not identified. Tests showed that there are undescribed peculiarities in the starch metabolism of this organism, indicating that *B. aerogenes* does not hydrolize starch through the usual series of compounds and eventually utilize it as glucose. No reducing sugar appeared in the cultures at any time.—S. B-J.

1553. *Ueber neue Serumnährböden. (New Serum Media.)* E. CZAPLEWSKI. Deutsche med. Wchnschr., 1920, 46, 828-829.

Blood serum, treated with just enough alkali to render it non-coagulable after sterilization is recommended as an excellent base for nutrient media, which are readily heat-sterilizable. When combined with dextrose and given a proper hydrogen ion concentration they are suitable for the cultivation of many fastidious organisms.—B. C.

1554. *Tropon als brauchbarer Ersatz von Pepton zur Bereitung von Bakteriennährböden. (Tropon as Substitute for Peptone in Bacterial Culture Media.)* LUDWIG BITTER. Deutsche med. Wchnschr., 1920, 46, 830.

Tropon, a peptone prepared by digestion of legume protein, is suggested as a substitute for meat peptone. It must however be used in greater concentration (2 per cent) than ordinary peptone to yield satisfactory results.—B. C.

1555. *Über die Gegenseitige Schädigung und Förderung von Bakterien.* (The Mutual Injury and Stimulus between Bacteria.) E. G. PRINGSHEIM. Centralbl. f. Bakteriologie (etc.), Jena, 2. Abt., 1920, 51, 72-85.

Simple methods are suggested for the study of the mutual influences of two cultures when grown on the same plate. When *Bacillus mesentericus vulgatus* is grown together with *B. diphtheriae* on the same plate, the former will exert a decided antagonism to the growth of the latter, in the form of a zone around each colony of *B. mesentericus vulgatus*, so that only 8-10 small colonies of the latter are sufficient to repress entirely the growth of *B. diphtheriae* on a Petri dish. But, in addition to the injurious action, *B. mesentericus vulgatus* exerts a stimulating action upon *B. diphtheriae* by allowing the formation of giant colonies of the latter within the zone of influence of the former. The substance produced by *B. mesentericus vulgatus* is in the nature of a poison which stimulates in small doses while it acts injuriously in large doses; this substance is thermolabile and the true nature of it could not be established. Other spore formers of the hay-bacillus group, 8 of which were tested and some of which were identified as *B. subtilis* and some as *B. mycoides*, did not exert the same antagonistic action. Organisms allied to *B. diphtheriae proteus* strains, *B. mycoides* and meningococci were acted upon by *B. mesentericus vulgatus* in a manner previously described, while other organisms such as *B. coli* and *B. paratyphosus* A were not affected. The antagonistic action of various bacteria upon the influenza bacillus, gonococci and anaerobes was also investigated.—S. A. W.

### PHYSICAL CHEMISTRY

1556. *Ultraviolet Spectroscopic Studies on Blood Serum. I. The Antagonistic Action of Salt in Blood Serum.* T. TADOKORO. J. Infect. Dis., Chicago, 1920, 26, 1-7.

The antagonistic action of different salts causes changes in the colloidal state of blood serum. Under the ultramicroscope, it was seen that when serum was mixed with zinc sulphate or calcium chloride its fine particles formed larger aggregates and their Brownian movement stopped. Subsequent addition of sodium chloride to this serum caused the aggregated particles to become redispersed as in the original serum. Photographs of absorption spectra of serum in the presence of these salts are reproduced, showing the changes in the degree of dispersion and of the structure of the particles in the serum.—S. B-J.

1557. *Ultraviolet Spectroscopic Studies on Blood Serum. II. The Difference in the Colloidal State of Normal and Immune Serum.* T. TADOKORO. J. Infect. Dis., Chicago, 1920, 26, 8-15.

This is a further attempt to relate the properties of immune serum to the colloidal state of the serum. Spectroscopic comparisons were made between the sera of various normal animals and certain immune sera. It was found that the absorption band of immune serum between the wave lengths 2,350-2,400  $\mu\mu$  was much longer than that of normal serum.—S. B-J.

1558. *Ueber den Einfluss der ultravioletten Strahlen auf das Blut.* (The Effect of Ultra-violet Rays on the Blood.) KARL TRAUOGOTT. München. med. Wehnschr., 1920, 67, 344-349.

The number and volume of the erythrocytes in man are not influenced by irradiation with ultra-violet light. Normally, after irradiation, the proportion of leucocytes is the same in the capillary and non-congested venous bloods; the relative increase being the same after an exposure of 10 to 15 minutes. If, however, the time of exposure is smaller, then greater proportions of these cells are found in the capillary than in the venous blood. The leucocytes and lymphocytes are equally increased after irradiation. The clotting rate of such blood is accelerated and the platelets are increased in number.—B. C.

### BACTERIOLOGICAL TECHNIC

(See also Number 1592)

1559. *A Micro-Fermentation-Test for Bacteriological Diagnosis and for Fermentation-Tests in the Control of the Chemical Purity of Carbohydrate-Preparations.* H. O. SCHMIDT-JENSEN. From the Royal Veterinary and Agricultural Serumlaboratory of Copenhagen. No. LXVIII, originally published in—DenKgl. Veterinaer-og Landbohøjskoles Aarskrift, Copenhagen, 1920, pp. 87-121.

A micro fermentation-test has been devised, not as a result of dissatisfaction with the macro-method, but to render more economical the consumption of rare and expensive preparations. The micro-method to be given below requires half a milligram of carbohydrate per test, thus giving 2000 estimations per gram—the macro-method requiring forty times this quantity.

*Technic.*—Glass tubing of good quality, 1.5 mm. inside diameter, is cleaned and drawn out over the blow-pipe at one end as shown in figure 1. The opposite end is furnished either with a cotton plug armed with a fine needle (insect-needle) or with an ordinary cotton plug to be replaced afterwards by a special closure or cover (figs. 4-6). After dry sterilization the tubes are filled with bouillon by aspiration by the mouth directly or by means of rubber tube and mouthpiece; the cotton remains intact and must not be moistened. The inside diameter of the tubes having been measured beforehand, the quantity of culture medium drawn in may be controlled simply by measuring the length of the column of fluid in the tube, 56.6 mm. cor-

responding to 0.1 cc. in a 1.5 mm. tube. By raising the drawn out end of the tube the fluid is drawn into the upper parts, as seen in fig. 1, and remeasured. The capillary point can now be closed in the border of a flame without heating the medium. The air bubble in the closed end is removed by knocking the table top slightly, the tubes being protected inside the hand of the operator. All air bubbles must be removed before sterilization. This latter process is effected by steaming the tubes, well protected from moisture by absorbent cotton and filter paper, for 10 minutes, a longer time being unnecessary; when ordinary aseptic precautions have been observed, long continued heat is injurious to delicate carbohydrates. The tubes now being ready for use, transfers are made either by a thin platinum needle or fine glass capillary (anaërobes). The tubes are reclosed either by the armed plugs already mentioned

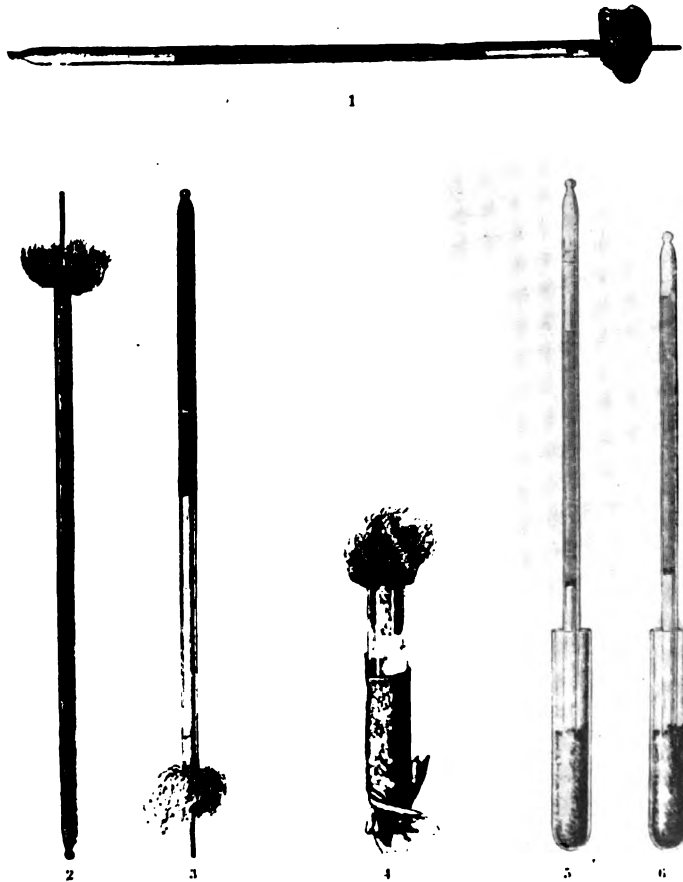


FIG. 1.

(figs. 1-3) or by means of sterile outside cotton closures (figs. 4-6), the ends surrounded by the cotton plug being forced down into small test-tubes. This latter form is preferred since it is both handy and reliable, provided the tubes need not be opened.

The tubes, placed in a moist chamber, are now ready for incubation. Cleaning of tubes after use would hardly pay, one kilo of glass tubing being sufficient for 800 tubes.

As the culture-medium, neutral glucose-free bouillon is used; to this is added 1 per cent of a concentrated watery litmus solution and 0.5 to 1 per cent of the carbohydrate to be tested.

*Applicability.*—The micro-tubes can be used for both facultative (coli-typhoid strains and a streptococcus have been tested) and obligate anaërobes (Ghon-Sachs' bacillus and *Bac. edematiens* (Weinberg) have been tested) with results corresponding wholly with those obtained using the ordinary tubes. The special advantage of the micro-fermentation-tube is that of economy, 1 gram carbohydrate sufficing for 2000 tests.—K. F. M.

1560. *Ein neuer Diphtheriendährboden. (A New Diphtheria Culture Medium.)* KARL KLEIN. Deutsche med. Wchnschr., 1920, **46**, 297.

Mix 9 parts of horse or other serum with 1 part of 15 per cent NaOH and hold at 37° for 2 days. The mixture is then neutralized with HCl. Add 4 parts of nutrient agar and heat at 105° for half an hour. The advantage of this medium over Löffler's serum is that it is completely sterilizable, transparent, permanent, capable of being poured and saving in serum.—B. C.

1561. *Die Untersuchung von Bakterienkulturen mittels des Agglutinoskops. (Study of Bacterial Cultures by Means of the Agglutinoscope.)* PHILALETHES KUHN. München. med. Wchnschr., 1920, **67**, 600-601.

The agglutinoscope is recommended as an aid in the examination of bacterial cultures. Nodules appearing upon old cultures growing on agar slants are quickly recognized, and can then be easily removed with the platinum loop for further study.—B. C.

1562. *Zur Technik der Levaditi-Methode. (The Technic of the Levaditi Method.)* JOHANN SAPHIER. München. med. Wchnschr., 1920, **67**, 552-553.

A rapid method is suggested which eliminates disturbing precipitation in the reducing solution. The tissue, 5 to 7 mm. in thickness is treated as follows: (1) 5 hours in 20 per cent formalin; (2) 5 hours in 90 per cent alcohol; (3) 10-20 minutes in distilled water; (4) 12-15 hours (over night) in 2 per cent silver nitrate (Merck); (5) 10-15 minutes in pure concentrated ammonia. Steps 1 to 5 are carried out in an oven at 57°C. (6) Wash briefly in distilled water and reduce for 1-2 hours at room temperature in the reducing fluid (pyrogallol, 4 parts, 40 per cent formalin, 5 parts and water to make 100 cc.); (7) 2-4 hours in 70 per cent alcohol and then quickly imbedded.—B. C.

1563. *The Selection of Kieselguhr for the Filtration of Serums.* GEORGE E. F'WE. J. Lab. & Clin. M., St. Louis, 1920, **5**, 539-540.

The author's experiments lead him to the following conclusions: "We are reduced to the necessity of actually comparative filtration experiments regarding loss of serum by absorption, rate of filtration and clarity of filtrate. In addition, chemical examination is necessary in order to insure absence of excessive organic matter and moisture."—F. W. H.

1564. *A Simple Apparatus for Obtaining Blood Samples.* PAUL G. WOOLEY. J. Lab. & Clin. M., St. Louis, 1920, **5**, 612-613.

This apparatus consists of a 15 cc. centrifuge tube in the mouth of which is inserted a two hole stopper, one of the holes to carry an 18 gauge,  $\frac{1}{4}$  inch hypodermic needle, the other a piece of glass tubing bent at right angles.—F. W. H.

1565. *A Convenient Stopcock-Needle-Cannula.* PAUL J. HANZLIK. J. Lab. & Clin. M., St. Louis, 1920, **5**, 540-541.

An illustrated description of this apparatus which the author has found a desirable substitute for the glass cannula and burette.—F. W. H.

1566. *Spiegelkondensor mit direkter Beleuchtung. (Mirror Condenser with Direct Illumination.)* L. ARZT. Wien. klin. Wchnschr., 1920, **33**, 379-380.

A mirror condenser with an attached lamp of low power is described for direct use on the microscope in dark-field work.—B. C.

## INDUSTRIAL BACTERIOLOGY

1567. *Influence of Fermentation on the Starch Content of Experimental Silage.* A. W. DOX AND LESTER YODER. J. Agric. Research, Wash., 1920, **19**, 173-180.

It is sometimes assumed that starches undergo changes during the formation of silage from green corn. In order to investigate the matter the writers prepared experimental silage in jars in the laboratory and made analyses at different stages for moisture, total acidity, alcohol, sugars, and starch.

They find that changes in total acidity, alcohol and sugar are entirely independent of the sugar content of the ensiled corn and of the silage produced from it. The starch content remains constant throughout the fermentation process and the first intermediate products that would result from the decomposition of starch are not present in demonstrable quantities. The starch granules remain intact throughout the fermentation, undergoing no physical change that can be detected by microscopic examination. Such evidence plainly indicates that the starch is not decomposed.

Since starch constitutes about 10 per cent of the corn plant at the time of ensiling and represents over 400 calories of available energy per kilogram, the fact that no loss occurs during fermentation is an additional argument in favor of silage as an economical feed.—H. J. C.

## MYCOLOGY

(See also Number 1683)

1568. *Invertase Activity of Mold Spores as Affected by Concentration and Amount of Inoculum.* N. KOPELOFF AND S. BYALL. J. Agric. Research, Wash., 1920, 18, 537-542.

The senior author has previously shown that mold spores may release sufficient invertase to cause an appreciable inversion in 10 and 20 per cent sucrose solutions. The present work corroborates the conclusion that sugar solutions may be spoiled by this action of the spores.

The writers further show that the invertase activity is exhibited at concentrations of sugar varying from 10 to 70 per cent, the maximum activity occurring at concentrations of 50 or 60 per cent. An increase in the number of mold spores causes increased invertase activity in the sugar solution, the least number of spores required to produce the activity being 5,000 per cubic centimeter in the case of the blue *Aspergillus* and 50,000 to 110,000 in the case of *A. niger* or *Penicillium expansum*.—H. J. C.

1569. *Über den Einfluss der Temperatur auf verschiedene Funktionen der Hefe.* (The Influence of Temperature upon the various Activities of Yeasts.) HEINRICH ZIKES. Centralbl. f. Bakteriöl. (etc.), Jena, 2. Abt., 1920, 50, 385-410.

This is the second part of a detailed study of the influence of various temperatures upon yeast activities. Under the influence of various temperatures, yeasts undergo structural modifications, with the formation of varieties; but the change in form and structure will, in most instances, shortly disappear, as soon as the yeasts are cultivated again at normal temperatures. When yeasts have been kept for a long period at warm temperatures, then cultivated at low temperatures, there is a much slower multiplication (in 3 days) than that of the corresponding yeasts, cultivated further at the higher temperature, but the multiplication of the first continued between 3 and 7 days at a much faster rate than that of the latter. The favorable temperature for fermentation as well as for ester formation lies at 30°C., while the pigment formation of pigmented yeasts is much stronger at lower temperatures than at higher. With an increase in temperature there is a greater tendency for the yeasts to become softer and liquefied. Most yeasts were killed at 55°C., while individual cells of *Willia saturnus* survived in beerwort at 58°, *Schizosaccharomyces pombe* and *Saccharomyces logos* 60° and *Saccharomyces thermotilionum* 64°. A brief review of the influence of temperature upon the action of yeast enzymes is added.—S. A. W.

1570. *Erscheinungen beim Wachstum von Mikroorganismen auf stark rohrzuckerhaltigen Nährböden und die Chondriomfrage.* (Facts Brought out during the Growth of Microorganisms on Media Containing Large Amounts on Sucrose, and the Chondrion Question.) N. BEZSONOF. Centralbl. f. Bakteriöl. (etc.), Jena, 2. Abt., 1920, 50, 444-464.

The cultivation of molds on highly concentrated sucrose media (33 per cent to 65 per cent sucrose) brings about the formation of fruiting bodies in the form of perithecia. The fungi, when cultivated on concentrated sucrose media, show a finely granulated structure of the protoplasm. The formation of sexual cells in many fungi cultivated on sucrose rich media together with the increase in dispersed condition of the cytoplasmic units indicates a connection between these two phenomena. It is presumed that the "forced sexuality" in fungi is attained through a diminution of the process of oxidation: the organism reacts to the lack of oxygen by the change in its cytoplasm, this causing the appearance of sexual plasma and nucleus.

A few fungi show other distinct characteristics on the sucrose media, *Penicillium glaucum* producing giant conidia, *Penicillium brevicaulis* producing only a weak growth, *Aspergillus oryzae* causing a true alcoholic fermentation.—S. A. W.

1571. *Gegenseitige Wachstumshehmung bei Pilzkulturen.* (Mutual Growth Repression by Fungi.) RAPHAEL ED. LIESEGANG. Centralbl. f. Bakteriöl. (etc.), Jena, 2. Abt., 1920, 51, 85-86.

The formation of a gap at the point of contact of colonies of the same fungus upon a plate is compared to the gap formation produced when a few drops of concentrated sodium chloride solution are placed 1 to 2 cm. apart upon the surface of gelatin solution, containing some silver nitrate, in a Petri dish. The diffusion of the nutrients in the colloidal medium towards the colony in the first instance and the diffusion of the silver nitrate towards the place of silver chloride formation in the second instance explain the phenomenon of gap formation.—S. A. W.

## SOIL BACTERIOLOGY

1572. *The Effect of Gypsum on Bacterial Activities in Soils.* T. M. SINGH. Soil Sc., Balt., 9, 1920, 437-468.

In studies with Miami silt loam it was found that ammonification and nitrification were depressed by applications of gypsum but additions of lime stimulated these processes. One-hundred-pound applications (per acre) of gypsum stimulated nitrogen fixation by *B. radicola*. One-thousand pounds of gypsum per acre increased the yield of red clover.

Gypsum increased the acidity of the soil in proportion to the size of the application. The nitrogen and potassium content of the leguminous crops were not affected by gypsum except in the case of red clover, where an enormous increase in potassium content was noted. The nitrogen content of the soil was not markedly affected by gypsum. Comparisons with lime applications were noted throughout the work.—N. K.

1573. *Die Anpassung der Knöllchenbakterien an Nichtleguminosen.* (*The Adaptation of Nodule-forming Bacteria to Non-Leguminous Plants.*) GUSTAV BLÜNCK. *Centralbl. f. Bakteriol.* (etc.), Jena, 2. Abt., 1920, 51, 87-90.

An extremely interesting and important question from the point of view of maintaining permanent soil fertility and of solving the nitrogen problem of the soil in the most ideal form is touched on in this article, namely the adaptation of legume bacteria to non-leguminous plants. It is suggested that the lack of nodule formation in non-leguminous plants is due not to the plants themselves, but to the bacteria, which do not find the conditions favorable for their development. To be able to adapt themselves to the particular plants, the bacteria must attack the roots, they must penetrate into the roots and they must remain alive in the plants and multiply, transform into bacteroids. It is suggested that the bacteria be grown on root extract or root extract gelatin with a gradual increase in the concentration of the extract. After the bacteria have been adapted to the root extract, they are grown on the dead roots, selecting, for that purpose, young root seedlings washed with distilled water and sterilized. While the bacteria are now able to withstand the outer, chemical hindrance to growth, they have to adapt themselves yet to the protective plant ferments by increasing the content of their own antibodies. Active root extract is prepared by grinding clean macerated plant roots with freshly heated quartz into a paste; this is carried out as quickly as possible, aseptically, so as to avoid contamination and autolysis. The extract is then filtered through a Berkefeld filter into sterile containers. This extract is used in increasing amounts with gelatin, as in the case of the cooked extract. The medium is sterilized for 8 days at 50° for one hour. The bacteria are gradually adapted to the activated, organized medium. The bacteria thus adapted are now inoculated into the living plants, which is termed "the increase in virulence by plant passage." The plants are brought into a condition of hunger, by planting in quartz, sand or distilled water, while the streaming of sap within the plants is hindered by withdrawing light and heat. This article is of a preliminary nature.—S. A. W.

1574. *Jauchekonservierung mit Natriumbisulfat.* (*Manure Preservation with Sodiumbisulphate.*) F. PILZ. *Ztschr. Landw. Versuchswesen Oesterr.*, 1918, 21, 613-623.

As the growth of the fungi producing ammonia from urea is stimulated and growth of ammonia-destroying bacteria prevented by presence of acid, hence in Austria during the war (when sulphuric acid was not obtainable), sodium bisulphate, a by-product of powder manufacturing, was used. Forty to 60 kgm. of the salt, or a corresponding amount of aqueous solution is sufficient for 1 cubic meter of manure. The manure thus preserved shows about double the nitrogen content of untreated manure. (Matouschek in *Centralbl. Bakteriol.*, 2. Abt., Jena, 1920, 20, 186.)—H. J. C.

1575. *Über neue farblose Schwefelbakterien.* (*New Colorless Sulfur Bacteria.*) JOSEF GICKLHORN. *Centralbl. f. Bakteriol.* (etc.), Jena, 2. Abt., 1920, 50, 415-427.

Seven new species of colorless, single celled sulfur bacteria are described. These were isolated partly from river water, partly from soil and partly from mud of the botanical garden of the University of Gratz. None of the cultures were studied in pure culture. Some of the organisms accumulate sulfur crystals produced from K<sub>2</sub>S added to the culture, within the colony, but outside of the bacterial bodies. A study of the literature on the colorless sulfur bacteria is given.—S. A. W.

## PLANT PATHOLOGY

1576. *Eine Bakteriose der Gerste.* (*A Bacteriosis of Barley.*) GEORG GENTNER. *Centralbl. f. Bakteriol.* (etc.), Jena, 2. Abt., 1920, 50, 428-441.

An organism, *Bacillus cerealium*, is described causing a disease of barley and to some extent of wheat and rye, particularly in dry years. The organism is a short rod, 1.5 to 3 $\mu$  long and 0.6 to 0.8 $\mu$  thick, spore forming, with 1 to 2 polar flagellae; it is aerobic, gelatin-liquefying, and produces a red pigment in nutrient media. The organism produces brown to black-brown spots on the culm shoots at the base, often also on the knots and on the upper parts of the culm; the leaves are spotted black or covered with brown points, the upper ones early becoming yellow and dying off; the ears often become strongly dented; the grains are imperfectly developed. The bacillus is able to dissolve the middle lamella, the starch grains and the cell walls inside the grain, but not the husk or true cellulose from filter paper, potatoes and carrots. The products formed from the action of the organism upon the inner part of the grain consist chiefly of dextrins; these decomposition products offer a good medium for the development of various bacteria and fungi which accompany the bacillus and thus increase the injury.—S. A. W.

## DAIRY BACTERIOLOGY

(See also Numbers 1538, 1539, 1800)

1577. *Relation between Lactic Acid Production and Bacterial Growth in the Souring of Milk.* J. C. BAKER, J. D. BREW AND H. J. CONN. N. Y. Agric. Exp. Sta. (Geneva), Technical Bull. 74, 1919, 24 pp.

A report of two experiments in the souring of milk with a pure culture of the lactic acid organism in which bacteriological and acid determinations were made each hour or half hour. Reports are also given of 6 other similar, but less extensive experiments. Both microscopic and plate counts were made to determine numbers of organisms but the microscopic counts were used in the computations as these were felt to be more nearly correct. In one experiment, the bacteria were found to multiply very nearly according to geometrical progression, while in the other their multiplication lagged so much behind this rate as to show arithmetical increase. Considerable variation was noted in the rate of acid production per individual cell per hour. This rate tended to decrease as the curdling point approached, and for a vigorous culture, seemed to lie between  $5 \times 10^{-10}$  and  $10 \times 10^{-10}$  mgm. lactic acid per hour. The ratio of the total acid produced to the number of organisms present proved fairly constant. At the curdling point, a cessation in the multiplication of the bacteria was found to occur which is accompanied by a noticeable decrease in the rate of acid production.—R. S. B.

1578. *The Accuracy of Bacterial Counts from Milk Samples.* R. S. BREED AND W. A. STOCKING, JR. N. Y. Agric. Exp. Sta. (Geneva), Tech. Bull. 75, 1920, 97 pp.

A discussion of the results secured from the analysis of 3 series of milk samples by 6 analysts from the New York and the Cornell Agricultural Experiment Stations. In 2 series the samples were carefully prepared so as to present the most favorable conditions possible for accurate counting of individual bacteria. In each case 3 lots of practically sterile fresh milk were inoculated with known amounts of a skim milk culture of the colon bacillus in such a way that resultant counts were expected to show the ratio 1:2:4. Counts were made by a standardized agar plate method and by direct microscopic examination of dried milk smears.

As the bacteria were in small groups (average size—1.6 and 1.48 individual bacteria) the plate and microscopic counts were found to agree well with each other and the relation between them was found to be that normally expected—namely, the plate counts were intermediate in size between the group and the individual microscopic counts. The skill of the analysts and the uniformity of the technic was such that the coefficient of variability in the counts was reduced to less than 15 in all cases. The variability in the microscopic counts was slightly greater than that of the plate counts under the conditions present.

A comparison with the results obtained from a third series, in which miscellaneous samples of market milk were used, showed at once that the difficulties involved in getting comparable results were greatly increased where samples of this type were used. On account of the variable size of the groups of bacteria (these varied from 1.06 to 25.4 individuals) the plate counts were affected by a highly variable error, while the time involved in examining a sufficiently large amount of milk microscopically to give a good count limited the accuracy of these counts. The general conclusion reached is that under present conditions, dairy bacteriologists frequently attempt to draw finer distinctions in the quality of milk by means of bacterial counts than is justified by the accuracy of the technic used. It is suggested that the individual states should exercise a control over the methods used in making bacterial counts, where these are used as a basis for payment to dairymen.—R. S. B.

1579. *The Methylene Blue Reduction Test: A Simple Method of Determining the Number of Bacteria in Milk.* E. G. HASTINGS. Hoard's Dairyman, Ft. Atkinson, 1920, 60, 280.

The method of using the test is described. Milks decolorizing in 20 minutes are classed as poor and as a rule will contain over 20,000,000 bacteria per cc. Those that decolorize in from 20 minutes to 2 hours contain from 20,000,000 to 4,000,000; in 2 to 5½ hours from 4,000,000 to 500,000 and milks that require a longer period less than 500,000 and are classed as good milks.—L. A. R.

1580. *Milking Machines: V. The Production of High Grade Milk with Milking Machines under Farm Conditions.* JOHN W. BRIGHT. N. Y. Agric. Exp. Sta. (Geneva), Bull. 472, 1920, 27 pp.

A description of the results secured in improving the quality of the milk from two dairies sending milk into Geneva where the author visited the farms and operated and cleaned the machines by methods previously found successful at the Experiment Station dairy. An Empire machine was in use at one farm, and a Sharples at the other. In both cases as soon as the Station methods were put into use, an improvement in the quality of the milk was shown by the fact that each can of milk shipped had a bacterial count of less than 300,000 bacteria per cubic centimeter as determined by the microscopic count (equivalent to an official plate count of less than 60,000 per cubic centimeter). Conditions are also described at a third farm where an Empire machine was in use, at which place the dairyman himself had adapted the Station methods to his own needs with success in the production of a good quality milk.



A brief report is also included upon the quality of Geneva market milk as influenced by the use of milking machines. A comparison is given between the quality of 5361 samples of machine drawn milk and 16,231 samples of hand drawn milk. The quality of the entire milk supply for the city was found to be affected adversely by the use of machine milkers.—R. S. B.

1581. *Neglect of Details in the Care of Milking Machines Results in Low Grade Milk.* J. G. LUCKETT. N. Y. Agric. Exp. Sta. (Geneva), Popular edition Bull. 472, 13 pp. 1920.

A popular edition of Bull. 472 from the same Station intended for distribution among dairymen.—R. S. B.

1582. *An Epidemic of Ropy Milk.* H. A. HARDING AND M. J. PRUCHA. Ill. Agric. Exp. Sta., Bull. 228, 1920, 110-124.

A discussion of the ropy milk problem as it affects the business of milk companies handling large quantities of milk, combined with a discussion of the circumstances surrounding an epidemic of ropy milk that occurred during June, 1919, in one of the cities of Illinois. The finding of the ropy milk organism in the milk as delivered to the bottling plant, led to examinations at the individual dairies. The ropy milk organism was commonly found in the farmers' utensils and in many cases also in the water from the cooling tanks. At one farm where the ropy milk organism was repeatedly shown to be present on the utensils and in the water of the cooling tank, the overflow from the cooling tank was used for watering the stock. The conditions about the stock tank were such that the cattle got water and mud upon their coats. On two different occasions material from the flanks and udders of these coats caused ropiness in sterile milk. Thorough disinfection of utensils and cooling tanks usually caused the trouble to disappear, though the trouble frequently reappeared after an interval. It was found that an epidemic involving a large pasteurizing plant can be immediately reduced to a level where it will cease to be a cause for complaint on the part of milk consumers when attention is given to proper pasteurization and the milk is protected from the introduction of the ropy milk germ between the pasteurizer and the bottle. Complete elimination of the trouble is much more difficult.—R. S. B.

1583. *An Interesting Case of Milk Contamination.* C. S. SPOONER. J. Econom. Entomol., 1920, 13, 368-369.

A sample of milk containing dipterous larvae and puparia was examined by the author. The larvae probably entered the milk with dirt. These proved to be *Aphiochaeta scalaris* Tw. *Aphiochaeta ferruginea* Brunetti (a synonym of the species just mentioned) is known to cause myiasis of the intestine in man and is able to complete its life cycle in the intestine. This species has a very wide distribution and a wide diversity of larvae habit and its presence in milk suggests a possible method of its reaching the human intestine.—Z. N. W.

1584. *Milk and its Products.* EWEN MACKINNON. Sc. & Indust., Australia, 1920, 2, 213-224.

This is a general article dealing with the chemical nature of milk and describing the manufacture of (1) casein for making imitation celluloid, for the manufacture of numerous patent foods, and other commercial uses; (2) condensed sweet milk and powdered sweet and butter milk with their bacteriological and other problems; (3) lactose and (4) lactic acid by fermentation processes.—Z. N. W.

1585. *Dairy Produce Factory Premises and Manufacturing Processes: The Application of Scientific Methods to their Examination.* T. L. MACINNES AND H. H. RANDELL. Agric. Gaz. N. S. Wales, Sydney, 1920, 31, 255-264; 333-337; 485-494; 563-566.

This series of articles reports the result of an investigation of factory conditions in the manufacture of butter. Four examples of butter factories are given, in all of which pasteurizers had been installed and the proprietors were striving to produce good quality butter. One factory was an entirely modern establishment in which butter of almost uniformly good quality was obtained, but in the other three the butter was poor or deteriorated in quality shortly after manufacture.

The investigation was made in each case by an inspection of the premises and by making culture plates to represent all stages of the manufacturing process. Plates were made from the cream before and after pasteurizing and after ripening, from the wash-water used, and plates were exposed to the air at various places in the factory where air contamination of cream or butter might occur. By these methods it was found possible to locate the trouble as due to such causes as infected water, poor starters, or mold infected premises. By remedying the conditions the manufacturers were able to improve the quality of their butter.—H. J. C.

1586. *The Deterioration of Butter Through the Agency of Oidium lactis.* H. M. NICHOLLS. Agric. & Stock Dept., Tasmania, Bull. 86, 1919, 1-4.

A case is cited of a large vat of cream which had become completely filled with a mass of *Oidium lactis*.

The statement is made that this organism is the principal and in many cases the sole cause of the deterioration of butter in Tasmania, but no experimental evidence is given to support this statement. Contrary to the statement of Combs and Eckels, *Oidium lactis* will grow in butter when there is sufficient water content and the temperature is not too low.

Directions for the control of this fungus in the dairy are given.—L. A. R.

1587. *Versuche über die bakteriologische und milchwirtschaftliche Beschaffenheit des Süß-Grünfutters.* (Investigations on the Bacteriological and Dairy Characters of the Sweet Greenfeed.) R. BURRI. *Molkerei-Ztg.*, Berl., 28, 169-170.

We should learn whether or not sweet greenfeeds in general should be rich in bacteria and if so we should know something of the kinds of bacteria which occur in them. (Possibly causing inflation of cheese.) 1. Green feed in full fermentation gave in 20 samples up to 1,000,000,000 bacteria per gram of fermenting material. There were always present members of the hay and potato bacillus group, strict aerobes that are able to grow at high temperatures, spore forms that at 60° and above were the only bacteria present. *Bacterium coli* and similar producers of inflation were absent or occurred only in small numbers and only in layers that scarcely reached 50°. The optimum for these bacteria is around 40°. Lactic acid bacteria could not be found. A definite bacterial species characteristic of the changes in the sweet pressed feeds cannot be distinguished unless the hay and potato bacilli play an essential rôle in the production of ensiled feed.

Finished ready for feeding, 22 samples of sweet green feed showed 320,000,000 bacteria per gram; in individual cases as few as 10,000. The best samples appeared to be the poorest in bacteria. Hay and potato bacilli were present. Inflating bacteria were found exceptionally and then only in small numbers. Lactic acid bacteria were absent in most cases. The hay and potato bacilli are found mostly in the dark colored and manure-like parts of the silage which occurs on the side of the silo where too much air has gained entrance. Bacteria are apparently not essential to the warming to 50°. The warmth probably comes through the plant respiration. Further heat increase may be caused by bacteria which little by little take the place of the heat from the respiration of the plants. Since the finished silage on the average has only a moderately high bacterial content, consisting principally of hay and potato bacilli (varieties that should be reckoned as harmless), and since inflation bacteria are present only irregularly and in small numbers, it need not be excluded in the production of milk.—L. A. R.

1588. *La investigación de la cualidades normales de la leche por el cultivo de microbios apropiados.* (Investigation as to the Normal Quality of Milk by the Cultivation of Appropriate Bacteria.) JOSÉ LIGNIERES. *Bull. Soc. centr. méd. vét.*, Par., 1919, 96, 391-393; *Rev. zootec.*, Buenos Aires, 1920, 7, 169-170.

A method of determining the quality of milk is described. The milk to be analyzed is sterilized at 100°C. for one-half hour and left to stand until the following morning. At the end of this time, in which the cream rises to the surface, the lower part of the milk is withdrawn with a Chamberland pipette. The milk is then distributed in sterilized test tubes. The same day, these tubes are newly heated at 100°C. for one-half hour. This is repeated on the following day. The milk so prepared is placed in the incubator for the proof of the sterilization. Using the same technic, sterile test tubes are filled with normal milk which serves as a check. For experimentation the following cultures are used: (1) An avian pasteurella (fowl cholera); (2) *B. coli* or a streptococcus, and (3) a bovine salmonella (paratyphoid B). Three tubes of the milk which is to be analyzed, and 3 others of the normal milk are seeded with the cultures above, separately. The tubes so inoculated are placed in the incubator at 37°C. with a check tube, not seeded. These are observed every day, comparing the culture in the normal milk with that of the tube which contains the milk under investigation. The check tubes should show no change in appearance or reaction nor show any growth. The tubes inoculated with (1) ought to retain its appearance and normal reaction, very slightly acid, but containing a very abundant growth on the seeded organism. After 24 hours in the incubator it may be noticed that the tubes seeded with (2) contain a coagulation of the milk with a strong acid reaction. The tubes with (3) retain their normal appearance at the beginning but after a time varying between 24-48 hours, the formation of a soft curd is noticed which redissolves quickly. The reaction in this case is alkaline. On the following days, the milk takes on a yellowish-gray color, then an amber color, showing then, not the slightest appearance of milk; the reaction is then strongly alkaline and in the bottom of the tube is noticed a slight, white sediment.

If the milk contains some antiseptic the culture will not grow and the reactions will not be reduced. Number 1 is the most sensitive; the streptococcus is more sensitive than the colon bacillus.

If the milk has not been preserved and retains all of its natural properties, the tubes inoculated behave in an identical manner with those of the normal milk tubes, or it is evident in 24 hours. If on the contrary, the milk has not retained its natural properties, it shows a series of different phenomena, growth is checked, reactions incomplete, abnormal or negative.—H. M.

1589. *Studies of Reconstructed Milk.* A. F. STEVENSON, G. C. PECK AND C. P. RHYNS. *Pub. Health Rep.*, Wash., 1920, 35, 2011.

The report includes results of bacteriological determinations on finished reconstructed milk and reconstructed cream. The plant for the production of these products was established in the Government City of Nitro, West Virginia, a city of 25,000 built over night for war emergency purposes. The studies indicated that the output of the plant was satisfactory from a health standpoint. Of the samples tested 23.4 per cent of the counts were below 10,000 and 76.4 per cent below 50,000 organisms per cubic centimeter.—I. A. B.

1590. *Über die Ausscheidung des Bazillus abortus Bang mit der Milch.* (The Elimination of *Bacillus abortus* of Bang in Milk.) MAX WINKLER. Berl. tierärztl. Wehnschr., 1920, 36, 238. Abstr. from Inaug. Diss., Dresden, 1919.

The elimination of the Bang bacillus in the milk is found only in a portion of the infected cows. The bacilli appear soon after the abortion and may be found in the milk for several years. Goats that have aborted may shed bacilli in the milk.

In the absence of *B. abortus* lesions in inoculated guinea pigs, the author suggests that cultures be made from the spleen.—J. T.

## COMPARATIVE PATHOLOGY

(See also Numbers 1590, 1656, 1715, 1716, 1770, 1846, 1852, 1853, 1879, 1895, 1929)

1591. *El Servicio de Veterinaria Militar.* (The Service of Military Veterinary Science.) LUIS J. GARCIA. Rev. zootec., Buenos Aires, 1920, 7.

The record of the veterinarian in the British Army during the late world war is reviewed and comparisons made with the mortality records of the African Campaigns of 1899-1902 and those of the late war. Some of the duties of the veterinary corps are explained. The duties included the examination of horses before they were accepted by the army; the care of horses on transports; the prevention of disease and its treatment, in the field with the active units or at established veterinary hospitals; maintaining the efficiency in shoeing; furnishing the necessary equipment and medicines for the veterinary service; instructing schools of veterinary surgery, farriery and blacksmithing; instructing units in the care of the animals and the organization and direction of the stables.—H. M.

1592. *Notes on Thick Film Method of Staining Piroplasms and Anaplasms in Routine Veterinary Diagnostic Work.* A. GOODALL. J. Comp. Path. & Therap., Edinb. & Lond., 1920, 33, 103-105.

A fairly large drop of blood in the center of a slide and spread out with the corner of another constitutes the thick film. It is dried at room temperature, protected from dust. Without fixation the films are stained in a solution made up of 2 cc. of a 1 per cent watery eosin, 4 cc. of a 1 per cent watery solution of azur II in 220 cc. of distilled water. After being stained for 30 minutes wash in distilled water and dry at room temperature. Piroplasms and anaplasms are more concentrated and the hemoglobin being dissolved out they are more readily and easily seen. The organisms in diseases like anthrax are also more easily detected.—C. E. H.

1593. *Die Abteilung für Vakzinetherapie.* (The Department of Vaccine Therapy.) A. STRUBELL. Arch. f. wissensch. u. prakt. Tierh., Berl., 1918, 44, Suppl., 235-267.

Strubell reports the work of the Vaccine Division for the decade 1907-1917. The first five years were devoted to study of opsonins. The next five years were spent mostly in investigations along the line of partial antigen therapy of Deycke and Much and the studies of the Maragliano Institute in Genoa. The author discusses at length his work with partial antigens of staphylococci and the possibilities of the application of this method for the treatment of human and bovine tuberculosis.—J. T.

1594. *Bacillus enteritidis Infection in Laboratory Rats.* P. R. CANNON. J. Infect. Dis., Chicago, 1920, 26, 402-404.

*Bacillus enteritidis* was found to be the cause of a fatal epidemic in white rats in a laboratory. Cultural and serological reactions showed that the organisms obtained from 31 of 35 rats examined were identical with *B. enteritidis*. Flies and contaminated food were the chief vehicles of transmission of the infection. Fleas from infected rats gave cultures of *B. enteritidis*, but did not transmit the disease to other animals.—S. B-J.

1595. *Observations on Paratyphoid Bacilli Recently Isolated from Animals.* R. S. SPRAY. J. Infect. Dis., Chicago, 1920, 26, 340-346.

Organisms of the paratyphoid-enteritidis group were found to be the predominating flora in the tissues of animals dying of enteric disease. These bacteria could be cultivated from the internal organs of the animals when it was impossible to find representatives of this group in the feces or intestines. The organisms were studied in culture and by the usual absorption agglutination tests. Thirty-four out of 40 strains were identical with *B. suispestifer*, 2 with the human *B. paratyphosus* A, 2 with human *B. paratyphosus* B, and 2 were intermediate between *B. suispestifer* and *B. paratyphosus* B. *B. enteritidis* was not encountered.—S. B-J.

1596. *An Intracellular Protozoan Parasite of the Ducts of the Salivary Glands of the Guinea Pig.* L. JACKSON. J. Infect. Dis., Chicago, 1920, 26, 347-350.

A peculiar protozoan infection of the serous and mucous ducts of the salivary glands of the guinea pig is described and illustrated. The structure thought to be a protozoan parasite occurs within the cells of the ducts as an encysted organism of irregular, round or oval contour. The center of the parasite is occupied by a round or oval body which stains deeply and unevenly. Around this restiform body is a wide lightly staining zone, and outside of this a capsule. Merozoites are seen at times in the peripheral zone. The parasite has not been definitely classified, but is thought to be one of the coccidia.—S. B-J.

1597. *Bipolare Bazillen als Erreger einer seuchenhaften Konjunktivitis bei Einhufern in Ostafrika.* (*Bipolar Bacilli as a Cause of Infectious Conjunctivitis of Solipeds in East Africa.*) FRITZ RUPPERT. Deutsche tierärztl. Wchnschr., 1920, 23, 73-74.

Ruppert found a Gram-positive, bipolar organism which was pathogenic for rabbits, but not for guinea pigs, in the purulent conjunctival discharge.—J. T.

1598. *A Study of the Bacterial Flora of the Conjunctival Sac of the Horse, at the Central Veterinary Research Institute, Aldershot.* R. H. KNOWLES. J. Comp. Path. & Therap., Edinb., & Lond., 1920, 33, 13-22.

Healthy conjunctival sacs contain the following groups: diphtheroids, *Staphylococcus albus*, and streptothrices. Their relative scarcity is said to be due to the continual mechanical flushing of the eye by the lachrymal secretion and its being a poor medium for bacterial growth. The chief difference between the normal eye and that of recurrent ophthalmia is in the diphtheroids. They are the most numerous of the organisms in the normal eye and show the greatest increase in recurrent ophthalmia. The *Staphylococcus albus* and the streptothrix show a slight decrease. *Bacillus xerosis*, which is a diphtheroid, is avirulent. Its increase in recurrent ophthalmia is due to the favorable influence of the inflammatory condition on the growth of the organism.—C. E. H.

1599. *Observations sur le tétanos expérimental du cheval.* (*Observations on Experimental Tetanus of the Horse.*) J. BASSET, MONVOISIN, PINCEMIN. Bull. Soc. centr. méd. vét., Par., 1919, 95, 404-421.

The experimental study was made on two groups of horses, one of which received accidentally intravenous injections of tetanus cultures and the other received injections of tetanus toxin intraperitoneally, intravenously, subcutaneously in the neck, leg, and anterior and posterior pasterns. A description is given of chronic, subacute and acute tetanus. A careful study of all the symptoms leads to the conclusion that in the horse tetanus toxin is absorbed by the vascular system and reaches the nerve centers by the blood and not by the nerve trunks. There is also reported a study of the influence of the quantity of toxin on the duration of the period of incubation, symptoms and severity of the disease and of prognosis and treatment.—W. G.

1600. *Bacterium viscosum equi som Sygdomsaarsag hos Føl og Plagge.* (*Bacterium viscosum equi Causing Diseases in Foals.*) VALD. ADSESEN. Medd. f. d. Kgl. Vet.-o. Landbohøjsk. Serumlab. LXIII. Københ.. 1919, 19 pp. Reprint from Maanedskr. f. Dyrteæger, 1919, 31.

On examining 135 dead foals the author found 36 cases of a specific infectious disease, which he has named bacillary pyo-septicemia; the disease is followed by death in the course of the first days after birth; at autopsy there was always found embolic nephritis, as a rule also polyarthritis and sometimes embolic nodules in the lungs. Pure cultures of a Gram-negative bacillus characterized by slime production were isolated from the infected organs. The disease was later found in Sweden by Magnusson, who has proposed the name *Bacterium viscosum equi* for the organism. Inoculation experiments were performed on two new born foals with pure cultures of the organism and both died with typical pathological lesions.—I. A. B.

1601. *Versuche zum Nachweis der Anaphylaxie bei rotzkranken Pferden.* (*Investigations to Demonstrate Anaphylaxis in Glandered Horses.*) OTTO WALDMANN. Arch. f. wissenschaft. u. prakt. Tierh., Berl., 1918, 44, 253-289.

The author concludes, from experiments with glandered and glanders-free animals, that the mallein reaction and anaphylaxis are two distinct phenomena. He claims that the injection of dead glanders bacilli provokes an anaphylactic reaction upon reinjection of the antigen. Never, however, can an ophthalmic reaction be obtained in such animals. He further states that passive mallein hypersensitiveness can no more be transferred than can tuberculin hypersensitiveness. In the third place, Waldmann could not desensitize infected animals by injection of antigen—in fact, in some cases, after a reaction, a further injection of antigen would produce an aggravated reaction.—J. T.

1602. *Note relative aux traitements des lymphangites ulcéreuse et épizootique du cheval.* (*Note on the Treatment of Ulcerative and Epizootic Lymphangitis of the Horse.*) A. DELMER. Rec. de méd. vét., Par., 1919, 95, 452-459.

A general article dealing largely with treatment—W. G.

1603. *Note relative au traitement de la gale des équidés.* (*Note on the Treatment of Equine Scabies.*) A. DELMER. Rec. de méd. vét., Par., 1919, 95, 261-266.

The treatment is claimed to be equally effective for psoroptic and symbiotic as well as sarcoptic scabies. After noting the objections to other well-known methods of treatment the author describes a preparation of the following composition: peanut oil, 100 grams, soft potash soap, 100 grams, water, 180 grams, pure cresylic acid, 20 grams. The mode of preparation and application is described.—W. G.

1804. *Zur Lehre vom Rotze, Reinfektion und Provokationsverfahren.* (A Study in Glanders, Reinfection and Methods of Provocation.) SCHÜTZ. Arch. f. wissensch. u. prakt. Tierh., Berl., 1918, 44, 115-126.

In this discussion, Schütz calls attention to the greater resistance to glanders manifested in the Russian than in the German horses.

Horses with encapsulated and latent lesions frequently failed to give positive reactions to the serologic tests. Such cases may be provoked to reinfection under certain conditions such as marching, transportation, exposure, etc. They then invariably become open cases on account of lung infection, but can readily be detected by serologic tests.

He considers that it would be of practical value if we could provoke a reinfection and activation of latent cases by some such simple means as are practiced in human medicine for reawakening, for the purpose of treatment, latent malaria.—J. T.

1805. *Fievre typhoïde du cheval et anémie infectieuse.* (Equine Typhoid Fever and Infectious Anemia.) J. BASSET. Bull. Soc. centr. méd. vét., Par., 1919, 95, 542-449.

The conclusion is that typhoid fever of the horse and infectious anemia are distinct diseases and radically different. The former is essentially an acute disease, the latter a chronic disease.—W. G.

1806. *Infektiöse Bronchopneumonie—Infektiöse Anämie.* (Infectious Bronchopneumonia and Infectious Anemia.) D. WIRTH. Berl. tierärztl. Wehnschr., 1920, 36, 173-174.

The author takes issue with C. Titze for the stand the latter has taken in regard to the so-called Brussels' disease (infectious bronchopneumonia of horses). Titze considers this a complication of infectious anemia and not an independent disease. Wirth has records of observations on over 500 cases of infectious bronchopneumonia during 1914-15, in which no evidence of infectious anemia was present, and he considers infectious bronchopneumonia as a disease entirely apart from infectious anemia.—J. T.

1807. *Infektiöse Anämie und Infektiöse Bronchopneumonie.* (Infectious Anemia and Infectious Bronchopneumonia.) R. REINHARDT. Berl. tierärztl. Wehnschr., 1920, 36, 174-175.

Reinhardt cannot agree with C. Titze that the so-called Brussels' disease of the horse (infectious bronchopneumonia) is simply a complication of infectious anemia.—J. T.

1808. *Auf die Entgegnung von Reinhardt und Wirth: Infektiöse Anämie und Infektiöse Bronchopneumonie.* (The Opposition of Reinhardt and Wirth in regard to infectious Anemia and Infectious Bronchopneumonia.) C. TITZE. Berl. tierärztl. Wehnschr., 1920, 36, 175.

Titze insists that wherever he found a clear case of Brussels' disease in horses, he could not eliminate the presence of infectious anemia.—J. T.

1809. *Übertragung des Wechselfiebers der Pferde auf Schweine.* (Transmission of Intermittent Fever of Horses—Infectious Anemia—to Swine.) LÜHRS. Berl. tierärztl. Wehnschr., 1920, 36, 121-123.

Lührs concludes that swine are partially susceptible to the virus of infectious anemia of horses. The disease is mostly a latent and chronic one; the virus can be demonstrated in swine 143 days after the infection. Passage through swine does not increase the virulence for swine or horses. Urine from infected swine appears to be non-virulent for horses.—J. T.

1810. *Sobre la Etiologia de la Meningo-encefalitis Enzootica (Enfermedad de Borna) de los equinos.* (The Etiology of Enzootic Meningo-encephalitis of Horses—"Borna's Disease.") R. KRAUS. An. Soc. Rur. Argentina, Buenos Aires, 1919, 54, 861-867.

The writer gives the history of this disease, mentioning the countries in which it has been reported, describes its clinical appearance, and pathologic anatomy; then takes up the question of etiology. The writer gives evidence to indicate that it is due to a specific diplococcus. He shows photomicrographs of brain tissue containing the diplococcus in question and of a culture obtained from such tissue. He states that the disease has been produced by means of injections of pure cultures of the organism. He mentions the hope of obtaining a prophylactic vaccination against the disease.—H. J. C.

1811. *Sur la dermite granuleuse des équidés.* (Granular Dermatitis of Equines.) L. TEPPAZ. Bull. Soc. centr. méd. vét., Par., 1919, 95, 470-473.

There are given a few references to the literature, a description of the affection and a list of the remedial agents with notes on their effect. An inadequate description of the parasite, the larva of a spirochete (?) (one of the *Habronema*) is given.—W. G.

1812. *The Influence of the Health of the Calf upon its Fertility at Breeding Age.* W. L. WILLIAMS. J. Am. Vet. M. Ass., Wash., 1920, 57, 553-567.

The author believes that in large dairy herds the reproductive powers of heifers are largely dependent upon their health as calves, and that the general health of the calves is shown in their behavior at breeding age.

It is believed also that the greater the proportion of calf scours and pneumonia, the higher the rate of sterility and abortion in heifers. If gastro-intestinal disorders in the calf are mild the heifer is more apt to abort in her second than in her first pregnancy.—W. A. B.

1613. *The Virulence of Tubercle Bacilli Isolated from Bovine Lesions in India.* A. L. SHEATHER. J. Comp. Path. & Therap., Edinb. & Lond., 1920, 33, 73-103.

About 3 per cent of animals slaughtered had tuberculous lesions. About 18 per cent of those offered for slaughter were rejected on account of bad physical condition. This number would increase the percentage of animals actually having tuberculosis. Direct inoculation of small animals from lesions of the slaughtered animals indicates that the tubercle bacilli of Indian origin are distinctly less virulent than those of European origin. Indian cattle are less susceptible to infection with tubercle bacilli than are European cattle. Natural lesions were restricted to a few glands and these were to a large extent calcified.—C. E. H.

1614. *Tuberculose ombilicale primitive du veau. (Primary Umbilical Tuberculosis of the Calf.)* TH. MOREL. Bull. Soc. centr. méd. vét., Par., 1919, 95, 450-468.

The author concludes that his observations demonstrate the existence of primary umbilical tuberculosis. The affection develops slowly and is compatible with a good state of flesh in the calf. The new-born calf is less liable to umbilical tuberculous infection because it is not subjected to the soiled litter and there is also an excessive number of tubercle bacilli in cattle feces. It is therefore desirable to separate the calf from the mother.—W. G.

1615. *Von der Eutertuberkulose des Rindes und deren Vorkommen in Dänemark. (Udder Tuberculosis of Cattle and its Prevalence in Denmark.)* C. W. ANDERSEN. Arch. f. wissensch. u. prakt. Tierh., Berl., 1918, 44, 80-96.

Statistics, for varying periods at different abattoirs, are given. The author assumes that 41 per cent of the milch cows of Denmark are tuberculous. Of these, 1.4 per cent have tuberculosis of the udder. The percentage of supermammary lymph gland tuberculosis is twice that of tuberculous mastitis.

The mode of infection, histology, diagnosis and physical characters of the milk in tuberculosis of the udder are discussed.—J. T.

1616. *Tuberculosis Bovine. (Bovine Tuberculosis.)* Rev. zootec., Buenos Aires, 1920, 7, 292-295.

The plan of the law suggested by the deputy national doctor, Ramon J. Carcano, for the annulment of sale for defects in cattle (redhibition) as it is affected by bovine tuberculosis.—H. M.

1617. *La profilaxis antipestosa y la ensenanza popular. (Prophylaxis and Popular Education against Plague.)* LEOPOLDO URIARTE. Rev. zootec., Buenos Aires, 1920, 7, 190-194.

A discussion of the status of cattle plague in the Argentine, with some interesting information from a bulletin by the President of the National Department of Hygiene.—H. M.

1618. *Hvalseptikæmbacillen og dens Forhold til Odembacilgruppen. (The Bacillus of Whale Septicæmia and its Relation to the Black-quarter Bacillus and other Allied Bacilli.)* M. CHRISTIANSEN. Medd. f. d. Kgl. Vet.-o. Landbohøjsk. Serumlab. LXV. København. 1919. 45 pp. Reprint from Norsk Mag. f. Lægevid., 1919.

A bacillus formerly used by fishermen in causing infection of whales was investigated and found to be closely related to the Ghon-Sachs bacillus, and certain organisms isolated in braxy and in cases of malignant edema in various animals. It showed the following characteristic divergences: The whale bacillus was non-motile and without flagellæ, liquefied gelatin more slowly and seemed to form spores more readily in the infected material than the Ghon-Sachs bacillus and the bacillus of braxy. It agreed with them morphologically and culturally and in fermentation reactions.

The organism was highly virulent for guinea pigs, rats, mice, pigeons and sparrows. There was no cross agglutination between these three organisms, but in complement fixation tests the whale bacillus serum fixed the antigens of the other strains as well as its own antigen. In protection experiments on white mice the whale bacillus serum protected against infection by the braxy bacillus, but showed doubtful protection against the Ghon-Sachs organism.—I. A. B.

1619. *Om Kastning hos Kvæget fremkaldt af Spiriller. (Abortion in Cattle Caused by Spirilla.)* AXEL THOMSEN. Medd. f. d. Kgl. Vet.-o. Landbohøjsk. Serumlab. LXIX. København, 1920. 9 pp. Reprint from Maanedskr. f. Dyræger, 1920, 32.

On examining eleven cases of abortion in cattle the author demonstrated in the fetuses of four cases the spirillum or vibrio (*Vibrio fetus*) first described by McFadyean and Stockman and lately by Theobald Smith. Spirilla were detected in the stomach contents, tracheal mucus and lungs of the fetuses and in fetal membranes and uterine discharges. Pure cultures were obtained from two of the cases in the way described by Theobald Smith (blood agar medium).—I. A. B.

1620. *Der Milzbrand unter den Rindern des Königreichs Sachsen in den Jahren 1859 bis 1916. Epidemiologische Betrachtungen. (Anthrax in the Cattle of Saxony from 1859-1916. Epidemiological Consideration.)* RICHARD EDELMANN. Arch. f. wissensch. u. prakt. Tierh. Berl., 1918, 44, Suppl., 489-511.

Statistics are given of the prevalence of anthrax in Saxony for the above period. Etiology is discussed under the headings of (a) meteorological and telluric conditions; (b) hides

from overseas used in industry; (c) use of contaminated fertilizer; (d) improper disposition of anthrax carcasses; (e) emergency slaughter of anthrax affected animals; (f) woody consistency of feed during dry years; (g) feeding of imported feeds; (h) other influences.

The author considers that the importations of concentrated feeds, American hides and foreign fertilizer are responsible to a great extent for the spread of the infection. During the war, when these importations were not to be had, anthrax was at a low ebb and suggests future control, especially over the use of imported feeds.

It is of interest to learn that, for the past 10-15 years as far as is known, no anthrax carcasses were buried but were removed in specially constructed wagons to knackeries which were provided with high pressure steam sterilizers.—J. T.

1621. *Schutzimpfung gegen die Hämoglobinurie der Rinder.* (Immunization against Hemoglobinuria of Cattle.) PRÖSCHOLDT. Berl. tierärztl. Wchnschr., 1920, 36, 133-135.

Immunization with defibrinated blood from young cattle that have withstood artificial infection is recommended before the cattle are turned into pasture. Only young normal animals, not heavy with calf, should be immunized.—J. T.

1622. *Histologische Studien die Kieferaktinomykose des Rindes.* (Histological Studies of Actinomycosis of the Jaw of Cattle.) E. JOEST AND A. ZUMPE. Arch. f. wissensch. u. prakt. Tierh., Berl., 1918, 44, Suppl., 1-73.

An exhaustive article on this subject.—J. T.

1623. *The Cattle Tick.* T. HARVEY JOHNSTON. Sc. & Indust., Australia, 1920, 2, 347-351.

A general article taking up the distribution and life history, diseases carried, effect on commerce, and methods of control in Australia.—Z. N. W.

1624. *El aislamiento y la investigacion del "Anaplasma" por inoculacion de sangre sospechosa al carnero o a la cabra.* (The Isolation and Investigation of the "Anaplasma" by Inoculation of Suspected Blood into the Sheep or Goat.) J. LIGNIÈRES. Rev. zootec., Buenos Aires, 1920, 7.

Discusses the control of infected areas and methods of isolation of the *Anaplasma*, using sheep, goats and cattle.

The author concludes that the inoculation of the *Piroplasma bigeminum* and the *Piroplasma argentinum*, does not produce any effect on the sheep, nor in the goats in whose blood only a few were found. The infection of the sheep and goats with blood containing both the *Piroplasma* and the *Anaplasma* is only positive for the *Anaplasma*. If in one month or two following the inoculation of the sheep and goats, the blood is drawn and about 5 or 10 cc. injected into the veins or subcutaneously in new cattle, it produces in the latter, a pure anaplasmosis. The inoculation of the sheep and goats with blood suspected of containing *Anaplasma*, followed by the injection of their blood into the animals of the bovine species, it is a simple and very rapid method for investigating and isolating the *Anaplasma*. The procedure greatly facilitates the formation of the epidemiological chart of the *Anaplasma* in all of the regions where the affection is known to exist.—H. M.

1625. *A Contagious Impetigo of Cattle.* H. E. HORNBY. Vet. J., Lond., 1920, 76, 210-216.

The author describes a skin disease of cattle in Northern Rhodesia which makes its appearance usually during the rainy season. A protozoan parasite has been isolated as the true cause of the disease, which has been called the *Dermatophilus congolensis*. The lesions occur upon the back as a rule, but may be found anywhere on the body. At first small elevations on the skin are noticed which later become confluent until they form bare, wart-like scabs through which stick a few hairs. The spread of the disease results from co-habitation and mechanical fomites, while certain biological agencies are suspected. The removal of scabs and application of medicament of sufficient strength to kill the parasite give best results from a therapeutic standpoint. Arsenical dips have not proved satisfactory.—H. C. H. K.

1626. *To Tilfælde af Kastning af tuberkuløs Oprindelse.* (Two Cases of Abortion of Tuberculous Origin.) AXEL THOMSEN. Medd. f. d. Kgl. Vet.-o. Landbohøjsk. Serumlab. LX-VII. Københ., 1919, 8 pp. Reprint from Maanedsskr. f. Drylaeger, 1919, 31.

In connection with a communication by Professor B. Bang the author communicates two similar cases. No marked tuberculous changes of the fetal membranes were established, in common with the case described by Bang. The chorion was somewhat thickened and edematous. The cotyledons were red with yellow necrotic spots and were covered with detritus containing numerous tubercle bacilli. Giant cells and typical tuberculous tissue were not met with on microscopical examination of the cotyledons and chorion, but tubercle bacilli were present in small numbers. *Bacillus abortus* Bang could not be demonstrated.—I. A. B.

1627. *Morbus Maculosus beim Rind.* (Morbus Maculosis of Cattle.) M. JÖHNK. Berl. tierärztl. Wchnschr., 1920, 36, 247-248.

The diagnosis was made at autopsy. Bacteriological examinations were negative.—J. T.

1628. *Über die Ursachen der Kälberruhr. (Cause of Calf Scours.)* MARTENS. Berl. tierärztl. Wehnschr., 1920, 36, 163-164.

In his cases, Martens eliminated the food as the cause of scours and believes an intra-uterine infection of the fetus to be the cause. The infection is found in the stomach of newborn calves.—J. T.

1629. *Dysentery of Lambs.* S. H. GAIGER. Vet. J., Lond., 1920, 76, 261-268.

A disease occurring in lambs usually between the ages of 2 days to 2 weeks. The mortality is practically 100 per cent among the affected lambs and the course of the disease is rapid. Such symptoms as a marked dullness with high temperatures, a yellow stool which is frequently reddish or actually bloody later developing into a black scour, are discernible. Autopsy reveals severe inflammatory changes in the large bowel with small necrotic foci present. A small non-motile bacillus has been obtained which is believed to be the true cause of the disease. The author hopes to develop an antiserum for its prevention.—H. C. H. K.

1630. *Inflammation du sinus biflexe à forme épizootique chez le mouton. (An Epizootic Inflammation of the Interdigital Gland of the Sheep.)* CURASSON. Rec. de méd. vét., Par., 1919, 95, 268-273.

The disease occurred in 1917 at Kayes in Senegal. The gland and periglandular skin were involved in a purulent inflammation of great severity. An organism considered to be *B. necrophorus* was isolated from the pus. Inoculations resulted positively with sheep, cattle and rabbits. Treatment consisted in washing with cresol solution and packing with 2 per cent copper sulphate solution, and isolation of well from sick.—W. G.

1631. *Die Kokziodiose der Schafe. (Coccidiosis of Sheep.)* LERCHE. Deutsche tierärztl. Wehnschr., 1920, 23, 228.

Eight outbreaks of coccidiosis in sheep were encountered by the author in the fall of 1919. The disease affected only lambs about 2 months of age. The infection was favored by weakness in breeding, improper weaning and cold. The disease was manifested by refusal to eat, catarrh of nose and eyes, diarrhea followed by constipation, irregular heart action, grinding of teeth, passage of feces intermixed with mucus and, at times, with blood: general loss of flesh and paralysis follows in 14 to 28 days. Mortality about 30 per cent.

The coccidia of sheep are different from rabbit coccidia and apparently not identical with *Eimeria faueri* of Moussu and Marotel. They, however, look like *Eimeria arloingi* of goats.—J. T.

1632. *La coccidiose intestinale du mouton au Maroc. (Intestinal Coccidiosis of Sheep in Morocco.)* BOUIN. Rec. de méd. vét., Par., 1919, 95, 617-619.

There is given a brief description of the symptoms and lesions. The causal agent is claimed to be *Coccidium faueri* described by Moussu and Marotel. A few suggestions for treatment are given.—W. G.

1633. *Transformation of the Alveolar Epithelium in Verminous Pneumonia in the Sheep.* JOHN M'FADYEAN. J. Comp. Path. & Therap., Edinb. & Lond., 1920, 33, 1-10.

The article is an expansion of the description of a peculiar form of pneumonia observed in sheep 26 years ago. The lesions involved large areas of lung which had a dirty white color and a somewhat fleshy consistence. The same lesions have been met with several times since the publication of the first article. Apparently they are always the result of the infestation of sheep over a year old with the same species of worm. Similar lesions have not been observed in lambs dying from the common form of verminous bronchitis with large numbers of *Strongylus filaria* in the air passages.

The primary lesions appear to be those of a very typical catarrhal pneumonia. A secondary alteration is the occupation of some air cells by polynuclear leucocytes. This was probably caused by local infection with bacteria, following the primary irritation by worm parasites and embryos. Desquamation is complete in the pure catarrhal type of lesion. New cells following the desquamation are of a plump cubical type. A more advanced change in the transformation is the formation of a high columnar type of epithelium. The alveolar walls are thickened by the production of young spindle-celled connective tissue. This transformation over large areas of lung produces the appearance of white pneumonia. The exact cause of the alterations in this "white pneumonia" is not obvious. Obstruction of small bronchi by exudate explaining the abnormal form of the functionless epithelium, absorption of irritating products from bronchiectatic cavities in adjacent parts of the lung, adenomatous new growth, and tumor-like formations are suggested as contributing causes to the changes described.—C. E. H.

1634. *Om Rødsygeinfektion hos orskellige Husdyr, specielt hos Faar og Lam. (Swine Erysipelas among various Domestic Animals, particularly among Sheep and Lambs.)* M. CHRISTIANSEN. Medd. f. d. Kgl. Vet.-o. Landbohøjsk. Serumlab. LXVI. Kobenh., 1919. 14 pp. Reprint from Maanedsskr. f. Dyr læger, 1919, 31.

The organism of swine erysipelas was found responsible for an epidemic in a sheep herd in which the mortality among lambs was unusually high. The lesions consisted of hemorrhagic inflammation of the intestine, with enlargement and septic changes of the glands of the mes-



entery, degeneration of the organs and small hemorrhages under the endo- and epicardium. The organism grew in the characteristic way in gelatin and swine erysipelas serum protected against the organism in experiments on mice.—I. A. B.

1635. *Zur Nomenklatur der Schweineseuche und der Schweinepest. (Nomenclature of Hog Cholera and Swine Plague.)* F. V. HUTYRA. Berl. tierärztl. Wehnschr., 1920, 36, 185-188.

Hutyra discusses the names of hog cholera and swine plague and similar diseases and gives the following groupings and synonyms:

1. Hemorrhagic septicemia, Schweineseuche of Löffler & Schütz, classical swine plague, swine septicemia—Cause: *Bacillus suisepiticus*.

2. Hog cholera, Schweinepest, virus pest and pest of Schern and Stange. Virus pest and mixed infection of Joest, swine fever. Cause: Filterable virus,—secondary coli-typhoid group and *B. suisepiticus*.

3. Bronchopneumonia of pigs, enzootic catarrhal pneumonia of pigs, chronic swine plague, pig cough. Cause: faulty hygienic and dietetic conditions—secondary, various facultative pathogenic organisms.

4. Paratyphoid of swine, bacillary hog cholera of Dammann and Stedfeder and Joest, Ferkel (pig) typhus of Glässer and Pfeiler, caseous enteritis. Cause: Coli-typhoid group of bacteria.—J. T.

1636. *Beiträge zur Serumtherapie bei Tetanus und Schweine-Seuche-Pest. (Serum Therapy in Tetanus and in Hog Cholera and Swine Plague.)* HAAN. Berl. tierärztl. Wehnschr., 1920, 36, 245-247.

Of interest is the author's observation regarding the transmissibility of ovine hemorrhagic septicemia to hogs and warns that hogs must not be placed in sheep stalls that have not been cleaned.—J. T.

1637. *Notes on a Micrococcus Isolated from Cases of Broncho-pneumonia of Swine.* CHAS. MURRAY. J. Am. Vet. M. Ass., Wash., 1920, 57, 539-542.

The author has isolated a small Gram-negative micrococcus regularly from a number of swine suffering from broncho-pneumonia, so-called "flu." Pigs recovered from disease have shown very irregular susceptibility to injections of the organisms following their recovery. The organism is pathogenic for rabbits, guinea pigs, swine and the donkey, but not for poultry.—W. A. B.

1638. *Strongylus rubidus as an Etiological Factor in Gastric Lesions of Hogs.* W. J. CROCKER AND H. E. BRESTER. J. Am. Vet. M. Ass., Wash., 1920, 57, 527-538.

It is not believed that this parasite can of its own accord produce lesions which will prove fatal unless there is some primary cause to first reduce the vitality of the mucous membrane of the stomach.

The fact that it is found in large numbers in apparently healthy hogs does not mean that it is harmless. *Strongylus rubidus* may produce severe gastric lesions and sometimes death as a secondary invader.—W. A. B.

1639. *Dans la rage mue la langue n'est pas paralysée. (Dumb Rabies without Lingual Paralysis.)* J. BASSET. Bull. Soc. centr. méd. vét., Par., 1919, 95, 401-403.

A description is given of dumb rabies of the dog in which the tongue is not paralyzed and in which there is no hydrophobia, i.e., fear of water.—W. G.

1640. *Bacterium anatum N.S., the Etiological Factor in a Widespread Disease of Young Ducklings Known in Some Places as "Keel."* L. F. RETTGER AND M. M. SCOVILLE. J. Infect. Dis., Chicago, 1920, 26, 217-229.

A fatal disease of young ducklings was widespread in the eastern United States in 1918. The symptoms of the disease, noticeable within a week or 10 days after the hatching of ducks, were chiefly: weakness, sluggishness, anorexia and intense thirst. "After drinking, some of the ducklings drew themselves to full height, staggered, keeled over, and after one or two gasps, died—hence the name 'keel' for the disease."

From the blood and organs of these ducklings a Gram-negative bacillus was readily isolated. This bacillus, to which the name *Bacterium anatum* N.S. is given, closely resembles *B. paratyphosus* B in fermentation and agglutination reactions. It is pathogenic for chickens and ducks.

The organism was obtained in pure culture from ovarian cysts of breeding ducks. It is probable that the disease is transmitted from the breeders through infected eggs.—S. B-J.

1641. *Limberneck in Poultry.* S. D. WILKINS AND R. A. DUTCHER. J. Am. Vet. M. Ass., Wash., 1920, 57, 653-685.

The literature of the subject is carefully reviewed and the article is well illustrated. It is demonstrated that there is no relation between polyneuritis and limberneck. From their experiments the authors believe that it is not possible to produce limberneck symptoms in poultry by feeding or injecting the toxins produced by *Bacillus botulinus* and that symptoms of botulinus poisoning differ markedly from limberneck symptoms.

Limberneck symptoms were produced by feeding larvae of *Lucilia caesar* which had developed from eggs laid on limberneck carcasses. The consumption of spoiled meat, paint skins, and salt failed to produce symptoms of limberneck.—W. A. B.

1648. *Diphthérie aviaire.* (*Fowl Diphtheria.*) M. DONNAT. Bull. Soc. centr. méd. vét., Par., 1919, 95, 248-259.

The article contains a description of the clinical features and treatment of the disease. There is also a historical review of bacteriological studies together with a description of the morphological and cultural characteristics of an organism isolated from the disease. The organism was a long, slender motile rod with rounded ends, it also presented coccus forms. It was Gram-positive and readily stained by ordinary methods; growth was vigorous in ordinary media, gelatin liquefied, milk coagulated. The organism is tardily pathogenic for fowls and rapidly for guinea pigs. The turtle-dove is particularly susceptible. The effect of physical and chemical agents on the bacillus was studied. The production of a protective serum was attempted. The relationship of human and avian diphtheria and of avian diphtheria and contagious epithelioma is discussed.—W. G.

1649. *Tetanus in the Camel.* D. S. RABAGLIATI. J. Comp. Path. & Therap., Edinb. & Lond., 1920, 33, 10-12.

Personal observations of nearly 25,000 camels revealed only 4 cases of tetanus. That the majority of the animals had suffered wounds of some sort would seem to indicate a slight susceptibility to tetanus. No cases developed in from 200-300 castrations. Many of the animals were already suffering from wounds and bites of the testicles. Symptoms of the 4 cases observed were rather the ordinary symptoms of the disease.—C. E. H.

1644. *A Note on the Treatment of Surra in Camels by Intravenous Injections of Tartar Emetic.* H. E. CROSS. Bull. No. 95, Agric. Research Inst., Pusa, India, 1920.

The experiments here reported were begun in 1917. A camel was injected intravenously several times with 200-250 cc. of a 1 per cent solution of tartar emetic. This particular animal died 129 days after treatment but no trypanosomes reappeared in the blood. Other camels were injected with the tartar emetic solution, and as a result of a limited number of experiments, the author concludes that this treatment offers hope of being quite successful.—C. P. F.

1645. *Cénure du Coypou.* (*A Coenurus of the Coypu.*) A. RAILLIET AND A. MOUCUET. Bull. Soc. centr. méd. Vét., Par., 1919, 95, 204.

The article reviews the literature briefly on *Coenurus* and describes a new species found in coypu. The subject came from the menagerie of the museum of natural history of Paris. A description of the autopsy and of the parasite are given. The authors propose the name *Multiceps* or *Coenurus clavifer* for the parasite.—W. G.

## PARASITIC DISEASES

(See also Numbers 1537, 1596, 1603, 1624, 1625, 1631, 1632, 1633, 1638, 1799)

1646. *Leçon Inaugurale de la Chaire de Parasitologie et d'Histoire Naturelle Médicale de la Faculté de Médecine de Paris.* (*Inaugural Address—Chair of Parasitology, etc., University of Paris.*) E. BRUMPT. Presse méd. Par., 1920, 28, 121.

Brumpt reviews the development of parasitology, with special reference to the protozoa in human and animal disease. A plea is made for more extensive scientific training in the medical curriculum and for emoluments which will attract the best type of physicians to the experimental and teaching fields.—L. A. K.

1647. *Hookworm and Amoebiasis in California.* C. A. KOFORD. Calif. State J. M., San Fran., 1920, 18, 329.

The most important center of hookworm infection in California is among the miners of the Mother Lode in Amador County. An examination of 2747 miners from gold, copper and quicksilver mines revealed 295 cases of infection or 10.8 per cent. The prevalence of amebic infection in California is indicated by the following figures derived from the examination of the stools of various groups of individuals; (1) 66 Hindus gave 18 per cent of infection; (2) of 122 men in quicksilver mines, there was 40 per cent of infection; (3) of 66 laborers in the Hetch-Hetchy tunnels, there was 28 per cent of infection; and (4) of 154 students at the University of California, who are ex-service men, there was 53 per cent of infection. Many of these individuals present no symptoms of illness and must be considered in the rôle of carriers. The importance of the problem in relation to the public health is emphasized.—J. R. S.

1648. *The Treatment of Chronic Amebic Dysentery Cyst Carriers.* CHARLES L. McVEY. Calif. State J. M., San Fran., 1920, 18, 305.

A. Thirty-five cases of carriers of cysts at the University of California were treated with emetine hydrochloride, one grain, hypodermically each morning for 6 days combined with bismuth-emetine-iodide salol-coated pills three grains by mouth at bedtime for 12 days.

The results are tabulated as follows:

I. Number of cases treated.....	35
II. Number of cases relapsing following first course.....	10 (28 per cent)
III. Number of cases relapsing following second course.....	4 (12 per cent)
IV. Number of cases cured	
a. 30 days' observation.....	11 (31 per cent)
b. 60 days' observation.....	5 (14 per cent)
c. 90 days' observation.....	1 (3 per cent)
d. 120 days' observation.....	4 (12 per cent)

Subsequent observation will probably show 60 per cent to be too high a percentage of cure, as some of the cases observed after an interval of thirty days may relapse.

B. Benzyl benzoate was used upon 18 carrier cases. A 20 per cent alcoholic miscible preparation was given in dosage of 30 drops three times daily in a half glass of water after meals. Treatment was continued for a period of 2 weeks. In not one of the cases was a cure effected by the use of benzyl benzoate.—J. R. S.

1649. *Ueber die Diagnose der Amöbenruhr. (The Diagnosis of Amebic Dysentery.)* DR. HAGE. Deutsche med. Wchnschr., 1920, 46, 682-684.

A discussion of the extent of amebic dysentery in Germany and the laboratory methods of diagnosis.—B. C.

1650. *Infrequency of Intestinal Parasites in Young Children.* STAFFORD McLEAN. J. Am. M. Ass., Chicago, 1920, 74, 1774.

Examination of stools of children up to 12 years of age, in New York City, showed the presence of intestinal parasites in 2.27 per cent of the cases. In children of 2 to 12 years, 3.7 per cent were positive. In children of 4 to 12 years, 5.7 per cent were positive. Intestinal parasites are therefore infrequent in the children of New York City when living under good hygienic conditions.—P. G. H.

1651. *On the Anthelmintic Action of Benzyl Alcohol and Benzyl Esters.* DAVID I. MACHT. J. Pharmacol. & Exper. Therap., Balt., 1920, 14, 323-326.

Earth worms and round worms of the pig were exposed to the action of benzyl alcohol, benzylaldehyde, benzyl acetate and benzyl benzoate. All of these substances were toxic for these worms, benzyl alcohol being the most powerful and benzyl benzoate the least powerful anthelmintic. The therapeutic value of these drugs can be ascertained only by a thorough clinical study.—F. W. H.

1652. *The Genera of the Enchytraeidae (Oligochaeta).* PAUL S. WELCH. Tr. Am. Micr. Soc., Menasha, 1920, 39, 25-50.

A revised descriptive chart of the Oligochaeta.—J. H. B.

1653. *A Case of Balantidium coli Infection.* W. O. NESBIT. South. M. J., Birmingham, 1920, 13, 403-405.

A brief survey of the literature is followed by the report of a case.

The patient was a farmer, 65 years old. He had always lived in Mecklenburg County, North Carolina, and had been out of the state only twice in his life to visit in an adjoining county in South Carolina. His water supply was from an open well, near a pig sty, with the drainage away from the well: analysis of the water, by the city bacteriologist, showed no contamination. The patient had always fed and butchered his own hogs for market.

The patient had a prolonged watery diarrhea in childhood; and in 1891 he again had a diarrhea which lasted for 15 months. In 1914 he had another attack of watery diarrhea, with some loss of weight; and this diarrhea persisted, with periods of remission, especially in the winter months. In June, 1917, the diarrhea became more severe, with tenesmus, and there was mucus and blood in his stools. In September, 1917, he was confined to his bed, and lost 20 pounds in weight.

On examination, the patient was pale; and there was tenderness over the large bowel, especially the descending colon. He was sent to the hospital for treatment.

The feces contained blood and mucus, and numerous *Balantidium coli*—6 to 20 to a field of the microscope. There were no amebae and no ova of worms.

The blood examination showed 4,100,000 red cells, 70 per cent hemoglobin, 7400 white cells, and 2 per cent eosinophiles.

Proctoscopic examination showed ulcers in the rectum, 5 mm. to 5 cm. in diameter; some shallow and not injected; others deeper, red, indurated and undermined.

Treatment consisted of rest in bed, and soft diet, beginning with 1800 calories per day, and gradually increasing.

Emetin and quinine irrigations were tried with little benefit. Irrigations of 30 grains of tannic acid in a quart of water lessened the tenesmus, mucus and blood in the stools, and the frequency of the stools, in 10 days. After 5 weeks the balantidia were less numerous in the stools; the patient had gained 6 pounds in weight, and went home.

Since then he has had no blood in the stools, but he has periodical attacks of diarrhea, with increase in the number of balantidia in the stools. In 1918 he was given several rectal

irrigations of a 1:5000 solution of aurantium dye, with no appreciable effect on the number of balantidia in the stools.

Recent proctoscopic examination shows no ulcers in the rectum; but balantidia are still plentiful in the stools.—J. H. B.

1654. *Diseases due to Intestinal Parasites in Colombia and their Treatment.* OTO T. BROSIUS AND WILLIAM A. BISHOP. J. Am. M. Ass., Chicago, 1920, 74, 1768.

Hookworm disease is almost ubiquitous among the natives of the district of Zaragoza, 98 per cent of the inhabitants being infected. All forms of intestinal parasites apparently live and thrive in the same individual, no type producing conditions inimical to the life of others. Ninety-eight per cent of a selected list of apparently chronic hookworm cases showed eosinophilia, and the average of these cells in these cases was 10.91 per cent. *Amoeba histolytica* (*Entamoeba histolytica*) occurred in 12.5 per cent of the cases investigated, and *Trichocephalus dispar* (*Trichuris trichiura*) has an average incidence of about 34 per cent.—P. G. H.

1655. *Ueber Echinokokkenpneumozysten und die sogenannte albuminöse Expektoration bei Lungenechinokokkus.* (*Echinococcus Pneumocysts and the So-Called Albuminous Expectoration in that Disease.*) ALFRED ARNSTEIN. Wien. klin. Wchnschr., 1920, 33, 234-237.

A description of a case of pulmonary echinococcus infection accompanied by expectoration of serous material due to perforation into the bronchial passages. An extensive bibliography is appended.—B. C.

1656. *Perkutane Infektion bei dem Fohlen durch Larven von Strongyloides westeri.* (*Cutaneous Infection of Colts by Larvae of Strongyloides Westeri.*) L. DE BLIECK AND E. A. R. F. BANDET. Deutsche tierärztl. Wchnschr., 1920, 23, 201-203.

The authors were able to find larvae in the subcutaneous tissue of guinea pigs from 7½ to 30 minutes after applying to the skin a 3-day old culture of larvae developed from feces containing strongyloid ova. When a culture was placed on the skin of colts, the larvae penetrated and were demonstrated in the subcutem.

They were also able to find in mucus of the trachea of two colts, larvae 550-600 microns long, 4 and 5 days after above-described cutaneous infection. After 7 days, no more larvae could be found in the trachea.—J. T.

1657. *A New Bladder Fluke from the Frog.* J. E. GUBERLET. Tr. Am. Micr. Soc., Menasha, 1920, 39, 142-148.

An illustrated description of a new species found in the urinary bladder of a large bullfrog taken at Stillwater, Okla.—J. H. B.

## TROPICAL DISEASES

1658. *Typhusbakteriämie bei einen Malariakranken.* (*Typhoid Bacteriemia in a Case of Malaria.*) RUDOLF STRISOWER. Wien. klin. Wchnschr., 1920, 33, 378-379.

In a case of malarial fever with icterus, typhoid bacilli were found in the blood stream, though there were no clinical symptoms of typhoid infection. This may have been a typhoid carrier in whom the organisms had traveled from the bile capillaries to the blood because of the malarial infection.—B. C.

## MEDICAL ENTOMOLOGY

(See also Number 1623)

1659. *Einige Mitteilungen über gehäuftes Auftreten von Pediculus vestimenti unter der Bevölkerung Nürnbergs im Jahre 1919.* (*The Extensive Infestation with Pediculus vestimenti of the Population of Nuremberg in 1919.*) FEDERSCHMIDT. München. med. Wchnschr., 1920, 67, 542.

During demobilization many soldiers ran away before being deloused. Infestation of a large portion of the population with the clothes louse was first discovered by the school nurses in the course of their duties. That typhus fever was not also present is considered a stroke of good fortune.—B. C.

## EPIDEMIOLOGY

(See also Numbers 1620, 1703, 1704, 1719, 1784, 1795)

1660. *High Incidence of Typhoid in Small Epidemic.* J. P. LEAKE AND RICHARD MESSER. Pub. Health Rep., Wash., 1920, 35, 2197-2199.

An outbreak of typhoid fever at Hopewell, Va., resulting from the eating of salad contaminated with typhoid organisms is described. Ninety persons partook of a dinner, of whom 49 became ill enough to be confined to bed. The disease occurred in some vaccinated individuals (51 per cent) and in some who had had typhoid fever (7 per cent). The vehicle of infection was suspected to be mayonnaise dressing used on chicken salad, which had been

prepared by a woman who had been tired and complaining for about a week previous to serving the dinner. Seven days after the dinner she developed one of the most typically typhoidal of all the cases. A number of cases were atypical, of shorter duration and less severe than ordinary typhoid. The incidence of cases was 54 per cent of those exposed.

The mayonnaise was prepared on the morning of the day the dinner was served and was placed in an ice chest until 2 p.m. when it was placed on a shelf in the pantry, where it stood until 5 p.m. The maximum temperature during this time was 31°C. From 5 to 8 p.m. the mayonnaise stood on ice.

A single test made in preparing and handling mayonnaise dressing under conditions as closely approximating as possible those which obtained when the suspected dressing was prepared, showed there was a progressive increase in the growth of the typhoid bacilli.—I. A. B.

1661. *Further Note on Outbreak of Typhoid Fever at Hopewell, Va.* J. P. LEAKE, RICHARD MESSER AND AUBREY STRAUSS. Pub. Health Rep., Wash., 1920, 35, 2273-2274.

Further experiments with the infected mayonnaise dressing referred to in the Pub. Health Rep., 1920, 35, 2197-2199, showed that under laboratory conditions typhoid organisms will probably not proliferate but will slowly decrease at 31°C., as shown by plating on Endo medium at different intervals.—I. A. B.

1662. *Mills-Reincke Phenomenon and Typhoid Control by Vaccine.* HAROLD MCGEE. Am. J. Pub. Health, Concord, 1920, 10, 585-587.

The author states that if Hazen's theorem is accepted the pollution of a water supply will be responsible for three deaths from causes not ordinarily considered water-borne to one death from typhoid fever. Under such conditions the elimination of typhoid by anti-typhoid vaccine will tend to hide the true difficulty by removal of our best index of polluted water.—M. C. P.

1663. *Statistics of the 1918 Epidemic of Influenza in Connecticut with a Consideration of the Factors which Influenced the Prevalence of this Disease in Various Communities.* C.-E. A. WINSLOW AND J. F. ROGERS. J. Infect. Dis., Chicago, 1920, 26, 185-216.

The epidemic of influenza in Connecticut in 1918 cost the State 7700 lives, raising the total death rate for that year to 19.4 per 1000. The disease, starting in the East at New London, spread rapidly through the state. Quarantine completely protected isolated groups, indicating that the disease was transmitted by human contact. The mortality was higher among males than females, and it was proportionately very much higher at ages under 5 years and at ages from 20 to 40 than at other periods of life. The mortality was exceptionally high among persons of Italian mother nativity. The death rate from the epidemic was lower in rural than in urban communities, lower in agricultural than in manufacturing communities and very low in a group of small towns remote from any railroad. There was apparently a progressive decrease in virulence as the disease spread from its first focus to the western part of the state.

Tables, charts and statistical compilations are presented, illustrating the epidemiological discussion.—S. B.-J.

1664. *Influenza Pneumonia as Influenced by Dishwashing in 390 Public Institutions.* JAMES G. CUMMING. Am. J. Pub. Health, Concord, 1920, 10, 576-582.

Epidemiological observations indicate that eating utensils are the major avenue of saliva-borne disease distribution. The use of boiling water in the process of dishwashing will greatly reduce danger from this source.

Healthy adult carriers of the pneumonia-producing group of organisms are more susceptible than non-carriers. In those institutions where machine washed dishes were used the influenza-pneumonia mortality was 55 per cent less than in those where handwashed dishes were used.—M. C. P.

1665. *Bacteria of the Air in an Amusement Hall.* FOREST HUDDLESON AND THOMAS G. HULL. Am. J. Pub. Health, Concord, 1920, 10, 583-585.

During the height of an epidemic of bad colds and coughs, the air of an amusement hall filled with soldiers was so badly contaminated that an average of 82 organisms fell on blood agar plates per minute. Among the organisms were pneumococci and numerous staphylococci. After the epidemic had subsided, under similar conditions except that a 10-minute period of exposure was used, an average of 16 colonies developed per plate; 16 per cent were streptococci.

Excellent ventilation and elimination of overcrowding did not prevent enormous bacterial contamination of the air. Any one susceptible to the prevailing respiratory diseases could not help but receive infection by sitting through a performance of 1½ to 2 hours.—M. C. P.

1666. *Die Tonsillen als Eingangspforte für Infektionen. (The Tonsils as Portals of Entry for Infections.)* JULIUS CITRON. Deutsche med. Wchnschr., 1920, 46, 340-343.

In experimental paratyphoid, the normal pharyngeal lymphatic glands are the portal of entry for the infection *per os*. It is probable that ordinary infection by typhoid or para-

typhoid occurs by this channel. Demonstration of the presence of infecting agents in the tonsils is no proof that it is the portal of entry. Such an assumption is, however, rendered probable when tonsillar infection precedes the general infection, when tonsillar recurrences lead to generalized ones, when compression of the tonsils causes new exacerbations, and when tonsillectomy favors cure.—B. C.

1667. *Experimental Proof of Infection by a Healthy Diphtheria Carrier.* WILLIAM L. HOLT. Am. J. Pub. Health, 1920, 10, 477.

A young girl of 14 became a carrier, and was probably the source of infection in the case of two brothers who returned to the house, still under quarantine, while she was harboring virulent bacilli. Mild antiseptics and 5 per cent silver nitrate had been ineffective in ridding the carrier of bacilli. Two treatments with 2 per cent solution of gentian violet were followed by negative cultures.—I. S. F.

1668. *Quelques observations au sujet de la contagion de l'homme par les animaux tuberculeux. (Observations on the Contagiousness of Animal Tuberculosis for Man.)* CADIOT. Rec. de méd. vét., Par., 1919, 95, 441-445.

A general discussion before the Academy of Medicine à propos of the compulsory notification of tuberculosis in which it is brought out that there has been too much insistence on the transmission of animal tuberculosis to man and not enough on interhuman transmission.—W. G.

1669. *Ein Beitrag zur Frage der Tuberkulosebekämpfung. (The Question of Tuberculosis Control.)* WALTER BIEBER. Berl. tierärztl. Wehnschr., 1920, 36, 189-190.

Bieber quotes Orth regarding the increase in intestinal tuberculosis of man in Austria-Hungary and Germany during the war period. The bovine type was not infrequently found in these cases, and the author insists that, in the eradication of human tuberculosis, attention must be given to bovine tuberculosis. He also makes favorable comment upon the use of bovovaccine in immunising cattle against tuberculosis.—J. T.

1670. *Home Infections.* C. W. YOUNGMAN. Penn. M. J., 1920, 23, 457-459.

General discussion of spread of infections in the home with suggestions relative to the activities of the health officer.—C. P. B.

## PUBLIC HEALTH REGULATION

1671. *Au sujet de la prophylaxie de la rage dans le département de la Seine. (The Prophylaxis of Rabies in the Department of the Seine.)* H. MARTEL. Bull. Soc. centr. méd. vét., Par., 1919, 95, 340-353.

The article contains statistics of dogs seized by the police and of rabid dogs during 1916-1919 with recommendations relative to the police, tax measures, etc., necessary for the control of rabies.—W. G.

1672. *Police sanitaire de la rage. (Sanitary Police of Rabies.)* J. BASSET. Bull. Soc. centr. méd. vét., Par., 1919, 95, 356-367.

There is a discussion of the principles underlying a rational prophylaxis of rabies and an elaborate outline of the sanitary and police measures that should be taken to officially control the disease.—W. G.

1673. *The Fundamental Knowledge Necessary for Health Officers.* J. N. McCORMACK. South. M. J., Birmingham, 1920, 13, 498-501.

A general descriptive article.—J. H. B.

1674. *Ueber die Wiedereinführung der Anzeigepflicht bei Masern. (Reintroduction of Compulsory Reporting of Measles.)* RUDOLF JAHN. Wien. klin. Wehnschr., 1920, 33, 263-267.

Measles is shown to be on the increase in lower Austria, and on the basis of well-known reasons an appeal is made for the reinstatement of obligatory reporting of the disease by physicians.—B. C.

## SANITARY ENGINEERING

1675. *Malaria Control from the Engineering Point of View.* W. G. STROMQUIST. Am. J. Pub. Health, Concord, 1920, 10, 497-501.

"Malaria is the South's greatest problem. It affects 3,000,000 people and causes an estimated economic loss of \$1,000,000,000 yearly." Although its control presents inviting opportunities to the physician, to the biologist, and to the laboratory worker it is primarily a problem for the engineer. Of the various methods which have been demonstrated to be effective in reducing malaria incidence, mosquito eradication, particularly at the breeding grounds, offers the most efficient means for eliminating the connecting link between the infected and the well person. The elimination of mosquito breeding grounds is primarily an engineering project and improvements and further economies in malaria control will un-

doubtedly be bound up with innovations and inventions in the mechanical problems of drainage and ditching operations. The successes the engineer has met in the past must be his encouragement for the future. His opportunities are both numerous and urgent.—I. S. F.

1676. *By-Products from Sewage Sludge*. ROBERT SPURR WESTON. Am. J. Pub. Health, Concord, 1920, 10, 405-409.

A brief discussion of the present status of certain phases of sewage purification and the utilization of sewage sludge by-products.—I. S. F.

## DISINFECTION AND GROWTH INHIBITION

(See also Number 1817)

1677. *The Influence of Brilliant Green on the Diphtheria Bacillus*. J. A. KOLMER, S. S. WOODY AND E. M. YAGLE. J. Infect. Dis., Chicago, 1920, 26, 179-184.

Brilliant green, 1 part in 500,000 in salt solution or glucose broth killed *B. diphtheriae* in 2 hours. When the medium contained protein the bactericidal power of the dye was decreased. When, however, attempts were made to free diphtheria carriers of the organism by local treatment of the pharynx or ear with brilliant green, no permanent benefit was obtained. The use of brilliant green for the treatment of carriers of diphtheria and pseudodiphtheria bacilli usually resulted in the temporary disappearance of these bacilli from the noses, throats and ears of the treated persons, but the organisms reappeared shortly after the cessation of the treatment.—S. B-J.

1678. *The Effect of Pasteurizing Temperatures on the Paratyphoid Group*. E. M. TWISS. J. Infect. Dis., Chicago, 1920, 26, 165-170.

By incubation of whole flasks of milk after they had been pasteurized, it is shown that negative tests of comparatively small amounts (1 cc.) of milk removed during pasteurization or at its close cannot be accepted as proof of the death of all organisms in the milk. Strains of typhoid, paratyphoid and enteritidis bacilli survived in milk which had been heated to 60°C. for 30 minutes. These pathogenic organisms, therefore, were recovered after exposures to heat exceeding those of the generally used method of practical pasteurization.—S. B-J.

1679. *An Inquiry into the Cause for Variation in Determinations of Disinfecting Value*. B. FANTUS AND F. RUMRY. J. Infect. Dis., Chicago, 1920, 26, 351-354.

From experiments on the disinfecting power of citric acid, the usual variations in the time required to kill bacteria were observed. It was found that neither large variations in the number of bacteria nor the presence of clumps in the bacterial suspensions were the determining factors in these variations. The cause of the irregularity of "disinfecting time" was not discovered in this investigation.—S. B-J.

1680. *Remarks on Laboratory Investigation of Antiseptics and Germicides*. N. SULZBERGER. Med. Rev. of Rev., N. Y., 1920, 26, 361-367.

This article points out the unreliability of the results of the usual laboratory tests of disinfectants as a guide to their clinical value and the necessity for making physiological efficiency tests concomitantly.—F. W. H.

1681. *Soaps in Relation to their Use for Hand Washing*. JOHN F. NORTON. J. Am. M. Ass., Chicago, 1920, 75, 302.

Ordinary washing does not sterilize the hands. The cleansing properties of soap are more important than its germicidal or antiseptic effect. Some specially advertised soaps do not remove bacteria as well as do ordinary toilet soaps. When soap was left on the hands no germicidal action was observed. Soaps for which special germicidal action is claimed by the manufacturer have not proved to be preferable to ordinary soaps.—P. G. H.

1682. *Zur Kritik des öffentlichen Desinfektionswesens. (Criticism of the Practice of Public Disinfection.)* M. NEISSER. Deutsche med. Wchnschr., 1920, 46, 351-352.

Concurrent disinfection, to be effective, should be conducted in an organized fashion. Under present conditions, terminal disinfection with formalin may well be omitted in favor of steam or mechanical cleansing. Delousing plants should be available at all large hospitals.—B. C.

## FOOD BACTERIOLOGY

(See also Numbers 1791, 1852)

1683. *A Pink Yeast Causing Spoilage in Oysters*. ALBERT C. HUNTER. U. S. Dept. Agr. Bull. 819, 1920.

The organism causing a pink color in shipped oysters is a yeast-like fungus. The yeast is elliptical, measuring 6 by 4 $\mu$ . It reproduces by budding and does not form spores. The organism grows best at room temperatures (21°-25°C.) and does not grow at 37°C. The best medium for growth is dextrose agar, although it also grows on gelatin, potato, blood serum, and in broth and milk. The yeast does not produce acid, gas, nor alcohol in carbohydrate

media. It inverts saccharose. It does not produce indol nor phenol. It reduces nitrates to nitrates and ammonia. This pink yeast was found in large numbers in the oyster house and on utensils in the house. Of the examinations of the house and utensils 73.9 per cent were positive. The yeast was found less frequently in oysters before they were brought to the house. Of the oyster samples analysed 26.3 per cent were positive. Occasionally the yeast was found in deep and surface water from oyster beds, but was not found in mud samples from the bottom of the bay. For the purpose of preventing infection of opened oysters by the yeast, the oyster house and utensils should be washed occasionally through the opening season with a 1:2500 formaldehyde solution (formalin, 1:1000) as this solution kills the yeast.—S. H. A.

1684. *Botulism from Canned Beets: Report of Cases at Florence, Arizona.* W. G. RANDELL. J. Am. M. Ass., Chicago, 1920, 75, 33.

The outbreak investigated was due to beets canned in tin cans. The beets were not cooked but served with vinegar. No offensive odor was detected when the can was opened. Antitoxin was of little use and supportive treatment was discouraging.—P. G. H.

1685. *Botulism from Canned Ripe Olives.* HERBERT W. EMERSON AND GEORGE W. COLLINS. J. Lab. & Clin. M., St. Louis, 1920, 5, 559-565.

A report of the bacteriological examination of canned ripe olives causing an outbreak of botulism at Detroit.—F. W. H.

1686. *Food Poisoning.* W. L. DODD. Am. Food J., Chicago, 15, 20-22.

A general presentation covering botulism, paratyphoid infections and food idiosyncrasies.—J. B.

1687. *Kurzer Bericht über eine lokale Epidemie von Paratyphus-B mit schweren gastro-enterischen Erscheinungen. (A Local Epidemic of Paratyphoid B, with Severe Gastro-enteric Symptoms.)* FEDERSCHMIDT. München. med. Wchnschr., 1920, 67, 814.

Sausage caused an outbreak of paratyphoid B infection in 65 persons that ate it. Botulism is excluded because of the absence of its symptoms. The onset was acute and not in proportion to the quantity of sausage consumed. Recovery was also rapid, and after 8 days paratyphoid B organisms were absent from the stools. There was nothing suspicious about the taste or smell of the sausage at the time it was consumed.—B. C.

1688. *Bacteria in (so-called) Soft Drinks.* LOUIS GERSHENFELD. Am. Food J., Chicago, 1920, 15, 16-17.

Forty per cent of 15 samples obtained directly from plants in April and May showed *B. coli* in 10 cc. portions. *B. welchii* was present in one sample. Staphylococci, streptococci and diphtheroids were found. The bacterial counts ranged from 300 to over 1000 per cc. in all except two samples.—J. B.

1689. *The Perishability of the Egg.* E. J. W. DIETZ. Am. Food J., Chicago, 1920, 15, 36.

Physiological explanation of the early entrance of bacteria including a discussion of white diarrhea, odors, blood clots, and bacterial control.—J. B.

1690. *Sanitary Control of Food Manufacturing Plants.* L. M. TOLMAN. Am. Food J., Chicago, 1920, 15, 27-28.

The need for sterilization of containers and utensils before use.—J. B.

1691. *Progress in the Dehydration Industry.* C. E. MANGELS. Sci. & Indust., Australia, 1920, 2, 360-364.

This paper takes up 2 types of spoilage common in dehydrated vegetables; one, the hardest type to control, is infestation by moths and other insects; the other is due to chemical changes which are not associated with bacteria and molds, but are probably due to the action of oxidases or enzymes. Methods for controlling these types of spoilage have been greatly improved. There is still need of further investigation, especially in the technic of preparation.—Z. N. W.

## HEALTH BOARD LABORATORY METHODS

1692. *Bacteriological Examination in Suspected Plague Cases.* Pub. Health Rep., Wash., 1920, 35, 2164-2165.

A circular has been issued by the United States Public Health service regarding shipment of tissue of persons or animals suspected of suffering from bubonic plague. Directions for taking specimens from human cases (living) and human cases (necropsy) and from rodents are given and instructions for packing the same are included.—I. A. B.

1693. *Diphtheria Bacillus Stains with a Description of a "New" One.* HENRY ALBERT. Am. J. Pub. Health, 1920, 10, 334-335.

The relative advantages of the many stains which have been proposed for the recognition of the diphtheria bacillus are reviewed. Loeffler's methylene blue, well ripened by prolonged



exposure to sunlight to give a polychrome effect; toluidin blue or cresyl violet (acidulated with acetic acid); Beck's modification of Neisser's stain; Kinyoun's stain have been found the most favorable. The objections to each, however, were considered sufficient to justify a search for a new stain free from these objections. The "new" stain has the following formula:

Solution 1	
Toluidin blue.....	0.15 gram
Acetic acid (glacial).....	1.00 cc.
Alcohol (95 per cent).....	2.00 cc.
Water (distilled).....	100.00 cc.
Solution 2 is the iodine solution of the Gram stain	
Iodine.....	1.00 gram
Potassium iodide.....	2.00 gram
Water (distilled).....	300.00 cc.

Smears are fixed by heat, stained with solution 1 for 5 minutes; stain drained off without washing and solution 2 applied for 1 minute; washed off with water and dried. A number of material advantages are claimed for this stain.—I. S. F.

1694. *A Comparative Study of the Diagnosis of Specimens of Typhoid Fever, Tuberculosis, and Diphtheria in Different Laboratories of New York State.* ELLEN FINLEY AND JOSEPH S. LAWRENCE. N. York State J. M., N. Y., 1920, 20, 226-239.

In this study drops of blood from immunized rabbits were taken on aluminum plates for examination for typhoid agglutination, smears from throat cultures were distributed for examination for diphtheria bacilli and smears from sputum were submitted for examination for tubercle bacilli.

The authors conclude from this study: "(1) Standardization of laboratory methods of examination of specimens and systems of reporting results is desirable. (2) Blood from rabbits immunized against typhoid bacilli makes satisfactory specimens for agglutination tests. (3) For submitting dried blood specimens the aluminum plate gives satisfactory results. (4) Occasional interchange of specimens for examination and comparison of results promotes uniformity. (5) Employment of uniform methods in examination of specimens and the reporting of findings promotes standardisation."—F. W. H.

1695. *Weitere Versuche mit der Kapillarsteigmethode.* (Further Experiments on the Capillary Rise Method.) E. FRIEDBERGER AND E. PUTTER. München. med. Wehnschr., 1920, 67, 396.

Artificially infected typhoid feces was suspended in normal saline and one end of a strip of filter paper, 5 × 20 cm., dipped into the suspension for 15 minutes. Capillary rise of the fluid continued for another half hour. The strip was then pressed on Endo plates, immediately removed, and the plates incubated for 24 hours. Portions of the plates corresponding to the upper sections of the filter paper strips contained practically pure colonies of *Bact. typhi*. Coli colonies remained at the bottom.

The capillary method as outlined results in a general selection of the typhoid bacilli over others, thus making possible their ready isolation. A single plate seems to suffice for obtaining isolated colonies in great numbers. Many Gram-positive organisms remain in the lower sections of the paper strip along with the colon types.—B. C.

1696. *Dunkelfeldbeobachtungen der Spirocheta pallida nach Fixierung.* (Dark Field Observations of *Spirocheta pallida* after Fixation.) LEO DUB. Deutsche med. Wehnschr., 1920, 46, 794.

This is a method for the direct examination of dried smears for spirochetes. Ruge's fixing solution (acetic acid 1, formalin 20, distilled water 100) is applied to the smear which is then observed by the ordinary dark field technic. The spirochetes retain their characteristic appearance. If this examination is negative, the slide may still be stained as usual for further study.—B. C.

1697. *Eine emphelenswerte Methode für Spirochätenfärbungen.* (A Method for Staining Spirochetes.) ERICH BECKER. Deutsche med. Wehnschr., 1920, 46, 259-260.

This is a modification of the Fontana technic in which the tannin content of the mordant is increased, and Ziehl-Nielsen's carbol-fuchsin is substituted for the silver solution. The advantages claimed are saving in time and avoidance of overstaining.

1. Pour the fixing solution (glacial acetic acid, 1 part, formalin, 20, and water, 100) dropwise for 1 minute, renewing once or twice, upon a thin cover-glass preparation. Then rinse the preparation.

2. Mordant with 10 per cent tannin over a flame until a slight vapor rises for half a minute.

3. Rinse and stain with carbol-fuchsin (5 per cent phenol, 100 parts, saturated alcoholic fuchsin solution, 10 parts) for  $\frac{1}{4}$  to  $\frac{1}{2}$  minute. Rinse, blot and examine under cedar oil or balsam. *Treponema pallida* is colored red.—B. C.

1698. *Ein Verfahren zur elektiven Spirochätendarstellung in einzelnen Schnitten des Zentralnervensystems.* (A Method for Demonstrating Spirochetes in Single Sections of Central Nervous Tissue.) F. JAHNEL. Deutsche med. Wehnschr., 1920, 46, 793-794.

Methods based upon the use of protective colloids (gum arabic, gelatin) are given for the staining of spirochetes in frozen and celloidin sections. The original must be consulted for details.—B. C.

1699. *Neuere Färbungsverfahren für Tuberkelbasillen.* (*Recent Staining Methods for Tubercle Bacilli.*) K. W. JÖTTEN AND P. HAARMANN. München. med. Wehnschr., 1920, 67, 692-693.

A modification of the Ziehl-Neelsen method is recommended. After staining with carbol-fuchsin and decolorising with 15 per cent nitric acid, the preparation is counterstained with picric acid-alcohol (saturated aqueous solution of picric acid and absolute alcohol in equal parts). The sputum preparation has a greater transparency and more tubercle bacilli are visible in a field.—B. C.

1700. *Eine Einfache Tuberkelbasillenfärbung.* (*A Simple Stain for Tubercle Bacilli.*) WILHELM SCHAEDL. München. med. Wehnschr., 1920, 67, 693-694.

This stain is very useful to those with red-blue colorblindness. The stock dye solution is methyl violet BN in concentrated alcoholic solution, which is filtered before use. The staining solution consists of 1 part of the filtered stain plus 9 parts of 2 per cent carbol water. Stain as follows: 1. Apply the stain to the slide and heat until it boils (3 times), renewing the stain; or stain in a dish for 6 hours in an incubator; or stain for 24 hours at room temperature.

2. Wash thoroughly in a vigorous stream of water to avoid precipitates.

3. Decolorize with 3 per cent acid-alcohol until the preparation is gray or has only a pale violet tinge. Excessive decolorization need not be feared.

4. Wash thoroughly with water.

5. Counterstain with Bismark brown, 2 minutes, or with chrysoidin.

The tubercle bacilli are deep violet in color.—B. C.

1701. *Ueber die Verwendung des Kaliumpermanganats bei der Harn- und Sputumuntersuchung.* (*The Use of Potassium Permanganate in Urine and Sputum Examinations.*) M. WEISS. Deutsche med. Wehnschr., 1920, 46, 429-430.

Potassium permanganate may be used to distinguish between uric acid precipitates of phosphates and proteins, as well as for detecting urochromogen. A 1 or 0.1 per cent solution of the salt is very useful as a counterstain in the Ziehl-Nielsen technic. The permanganate should be filtered before use. The more dilute solution applied for 3 minutes is preferred because overstaining is impossible. This procedure gives a good background for observation of tubercle bacilli. Tissue cells appear very clearly outlined by this method.—B. C.

1702. *Eine neue Färbung für Tuberkelbasillen.* (*A New Stain for Tubercle Bacilli.*) DR. KONRICH. Deutsche med. Wehnschr., 1920, 46, 741.

The technic does away with the use of alcohol.

(1). Stain 0.5 to 2 minutes with hot (not boiling) carbol-fuchsin; (2) Rinse vigorously in water; (3) Decolorize completely with 10 per cent aqueous sodium sulfite; (4) Wash with water; (5) Counterstain  $\frac{1}{2}$  to  $\frac{1}{4}$  minute in aqueous solution of malachite green (saturated aqueous malachite green, 50 parts; water, 100 parts).—B. C.

## DIATHETIC AND DEFICIENCY DISEASES

(See also Number 1875)

1703. *Pellagra Incidence in Relation to Sex, Age, Season, Occupation, and "Disabling Sickness" in Seven Cotton-Mill Villages of South Carolina during 1916.* JOSEPH GOLDBERGER, G. A. WHEELER AND EDGAR SYDENSTRICKER. Pub. Health Rep., Wash., 1920, 35, 1650-1664.

White mill-operatives in 7 representative cotton mill villages with a total population of 4399, were included in the study. Among these there were 115 definite cases of pellagra, representing a rate of 26.1 per thousand and 73 cases recorded as "suspects" which if included would raise the incidence rate to 42.7 per 1000.

A statistical analysis was made of information obtained in regard to various factors. This showed that the disease was rare in children under 2 years; that the incidence was similar in males and females up to 20 years; that between 20 and 54 it was many times higher for females than for males. There was an increased incidence in April and May which reached its maximum in June. The season of onset was confined almost entirely to the 6 months April to September inclusive. Considerably more cases occurred among non-mill workers than mill workers. Disabling sickness did not increase the pellagra incidence rate, indicating that general debility is not an essential predisposing factor in pellagra.—I. A. B.

1704. *A Study of the Relation of Factors of a Sanitary Character to Pellagra Incidence in Seven Cotton-mill Villages of South Carolina in 1916.* JOSEPH GOLDBERGER, G. A. WHEELER, EDGAR SYDENSTRICKER AND R. E. TARBETT. Pub. Health Rep., Wash., 1920, 35, 1701-1714.

A study of the sanitary conditions in 7 representative cotton-mill villages in South Carolina was made in order to determine their relation to pellagra incidence. The sanitary rating of each of the villages was determined by the method of W. H. Frost, and this compared with the typhoid incidence and pellagra incidence. While the typhoid incidence suggested an inverse correlation with the sanitary rating, there was no such correlation with the pellagra incidence. The results obtained afford no support to the view that pellagra is "an intestinal infection transmitted in much the same way as typhoid fever."—I. A. B.

## CANCER RESEARCH

1706. *The Type Cell of the So-called Dural Endothelioma.* F. B. MALLORY. J. Med. Research, Bost., 1920, 41, 349-364.

The conclusions are in part as follows:

"There is no dural endothelium; the inner surface of the dura is bare except for fibroblasts. . . . The growing cells of the arachnoid frequently give rise to tumors which go under various names,—dural endothelioma, psammoma, fibroma, fibrosarcoma. The best term for the entire group of tumors would seem to be 'arachnoid fibroblastoma.' . . . The arachnoid fibroblastoma derives the blood vessels and connective tissue of its stroma from the dura. It can invade the dura, the skull and the soft parts outside, but it cannot pass through the arachnoid, from which it has arisen, and invade the brain. . . . Tumors frequently arise from the perineurium, occasionally in great numbers. . . . They differ distinctly from the arachnoid fibroblastoma in one respect,—they show a marked tendency to invade the nerve tissue and occasionally extend along it to such a degree as to form the so-called plexiform neurofibroma. These groups had best be grouped under the term 'perineural fibroblastoma.'"

The arachnoid and perineural fibroblastomas are described in detail and illustrated in ten plates.—A. C. E.

## DISEASES OF THE BLOOD, LYMPHATICS AND DUCTLESS GLANDS

(See also Number 1698)

1706. *The Diagnosis of Human Plague.* C. L. WILLIAMS. J. Am. M. Ass. Chicago, 1920, 75, 370.

Diagnosis is a matter of great importance since the possibility exists that the plague may appear in many of our seaports. There are four forms of the plague: (1) bubonic, (2) pestis minor, (3) septicemia and (4) pneumonic. The bubonic type is by far the most common. An outbreak of pneumonic plague has recently occurred in a small western city and if this should get beyond control a fearful epidemic would result. The organism can be recovered from the bubonic type by inserting the needle of a syringe into a gland and withdrawing some of the gland juice. Smears are made from this and the contents left in the syringe diluted with salt solution and injected into two guinea pigs. One or both of the guinea pigs will die within 10 days and will show characteristic lesions and the bacilli can be seen in large numbers. In the septicemic form 3 or 4 cc. of blood are drawn and used for smears and guinea pig inoculation. In pneumonic plague the bacillus is present in ever increasing numbers in the sputum.—P. G. H.

1707. *Ueber Tetragenussepsis. (Sepsis by M. tetragenus.)* HERMANN LÜDKE. München. med. Wehnschr., 1920, 67, 454-455.

Several cases of general sepsis are described in which the causative agent was *Micrococcus tetragenus*. The organism was readily isolated from the blood.—B. C.

1708. *Untersuchungen über die Entstehung akuter Leukämien. (The Origin of Acute Leukemias.)* HERMANN LÜDKE. Deutsche med. Wehnschr., 1920, 46, 345-348.

A true leukemia has not yet been produced experimentally, but evidence suggests that perhaps bacterial toxins in a previous or intercurrent infection prepare the ground for acute as well as chronic leukemias.—B. C.

## DISEASES OF THE DIGESTIVE SYSTEM

(See also Numbers 1649, 1658, 1660, 1661, 1662, 1687, 1731, 1792, 1793, 1873)

1709. *De la pathogénie du choléra. Troisième mémoire. Le protéide du vibron cholérique. (The Pathogenesis of Cholera. III. The Proteid of the Cholera Vibrio.)* G. SANARELLI. Ann. de l'Inst. Pasteur, Par., 1920, 34, 370-391.

The "toxic proteid" of the cholera vibrio was prepared by digesting a 24-hour culture of the organism with 0.1 per cent pancreatin in 10 cc. of fluid containing 0.01 gram of sodium carbonate. Five drops of toluene were shaken up in the fluid to kill the vibrios and the mixture placed at 37°C. for 24 hours. A slightly opalescent fluid was obtained by this digestion, in which the bodies of the bacilli were no longer recognizable. It was assumed that the pancreatin removed the ectoplasm of the vibrio, allowing the protein of the cell to pass into solution or colloidal suspension in the fluid.

This cholera proteid was found to be as antigenic as the bacteria killed by heat in saline. Rabbits injected subcutaneously with this preparation formed agglutinins as high as 1:3000. It was also toxic to the same degree as cultures of the cholera vibrio (the Isonzo strain). In guinea pigs, after intravenous or intraperitoneal injection of this material, the intestines showed hyperemia, edema, desquamation of the epithelium, and hemorrhages. This action was thought to be due to the reverse excretion of toxic material from the blood through the wall of the intestine. It was not possible, however, with this preparation to produce the typical algid stage of cholera.—S. B-J.

1710. *Luetisches Leberfieber bei einer 25 jährigen auf congenitaler Grundlage.* (*Syphilitic Hepatitis of Congenital Origin in a Woman 25 Years Old.*) ARTHUR BAER. München. med. Wehnschr., 1920, 67, 572-573.

The author describes a case of syphilitic hepatitis which, judging from the history, appears to be of congenital origin.—B. C.

1711. *Ueber Entzündung des Meckelschen Divertickels im Bruchsack.* (*Inflammation of Meckel's Diverticulum in the Hernial Sac.*) WERNER BUDDE. Deutsche med. Wehnschr., 1920, 46, 430-431.

Meckel's diverticulum, imprisoned in a hernial sac, may become the seat of an acute or chronic inflammation. Several such cases are described and discussed.—B. C.

## DISEASES OF THE GENITO-URINARY SYSTEM

(See also Numbers 1696, 1697, 1698, 1785, 1786, 1854, 1914)

1712. *Geschlechtskrankheiten und Prostitution.* (*Sex Diseases and Prostitution.*) DR. STRUVE. Deutsche med. Wehnschr., 1920, 46, 463-465.

Certain arguments are presented against the compulsory reporting of venereal diseases, from which it is concluded that such compulsory reporting is dangerous to the public health. It is based on the idea that newly infected cases will be reluctant about consulting proper authorities, and older cases, if irresponsible, cannot be readily restrained from further spreading the infection.—B. C.

1713. *Ueber die Behandlung gonorrhöischer Gelenkerkrankungen mit Vuzin.* (*Treatment of Gonorrheal Arthritis with Vuzin.*) W. MOBITZ. München. med. Wehnschr., 1920, 67, 843-844.

Joint puncture together with lavage and injection of 1:5000 vuzin solution in gonorrheal arthritis of the large joints has resulted in recession and cure of the infection. Only 10 cases have so far been treated in this manner, but they all responded rapidly.—B. C.

## DISEASES OF THE LOCOMOTOR SYSTEM

(See also Number 1713)

1714. *Postdiphtheritic Paralysis of the Respiratory muscles: Report of Case treated by Prolonged Artificial Respiration.* W. MCKIM MARRIOTT. J. Am. M. Ass., Chicago, 1920, 75, 668.

The majority of patients with postdiphtheritic involvement of the respiratory muscles die and therefore some form of artificial respiration should be attempted in spite of the possible danger of a resulting aspiration pneumonia.—P. G. H.

## DISEASES OF THE NERVOUS SYSTEM

(See also Numbers 1639, 1671, 1672, 1845, 1855, 1898, 1908)

1715. *Comment un chien d'apparence saine peut transmettre la rage.* (*The Possibility of an Apparently Healthy Dog Transmitting Rabies.*) P. REMLINGER. Bull. Soc. centr. méd. vét., Par., 1919, 95, 175-181.

Remlinger is of the opinion that there is in rabies a phase well in advance of the manifest symptoms, a blood phase or latent phase in which the animal shows no symptoms except perhaps a febrile attack. In this stage of the disease the female dog is able to transmit the disease to the offspring by way of the placenta and probably to man by way of the saliva.—W. G.

1716. *L'hérédité dans l'étiologie de la rage.* (*Heredity in the Etiology of Rabies.*) R. REMLINGER. Bull. Soc. centr. méd. vét., Par., 1919, 95, 196-198.

A young dog is able exceptionally to contract rabies without being bitten, scratched, licked, etc., by a rabid animal. The rabies does not occur spontaneously but is transmitted by the mother, who, contracting the disease from a rabid animal, may die of rabies before her offspring or may survive it. Part or the whole of a litter in such a case may contract the disease simultaneously denoting the congenital character of the disease.—W. G.

## DISEASES OF THE RESPIRATORY SYSTEM

(Except Influenza and Tuberculosis)

(See also Numbers 1655, 1664, 1665, 1723, 1724, 1725, 1726, 1727, 1870, 1897, 1912)

1717. *Bacteriologic Data on the Epidemiology of Respiratory Diseases in the Army.* HENRY J. NICHOLS. J. Lab. & Clin. M., St. Louis, 1920, 5, 502-511.

This article reports experiments undertaken to determine, if possible, the method of spread of respiratory diseases, the hemolytic streptococcus being used as the test organism.

Both the direct and indirect methods of transmission were subjected to critical experiments. In addition it contains a report on experiments to determine the antiseptic action of soap in dish water on *B. influenzae*, pneumococcus, *Streptococcus pyogenes*, *Staphylococcus aureus* and *B. typhosus*.

The theory that hemolytic streptococci are spread by dish water was not confirmed by these experiments and it was found that soapy dish water of proper reaction and made from the proper soap exerts an antiseptic action on these organisms. Intestinal organisms on the other hand may be spread through dish water.

Streptococci remain suspended in the air of an experimentally infected room for several hours and also in the air of streptococcus wards several hours after the patients have retired.—F. W. H.

1718. *The Bacteriology of Chronic Empyema*. J. E. GORDON. J. Infect. Dis., Chicago, 1920, 26, 29-42.

Twenty-five cases of empyema were studied bacteriologically by weekly cultures during a period of 3 months. Pus for culture was obtained through the usual thoracostomy wound by a protected rubber tube, modified from the West tube. A great variety of organisms were cultivated from these cases, the typical sequence of bacteria being, (1) hemolytic streptococci in pure culture, (2) gradual displacement of the streptococci by a flora of secondary invaders, (3) freeing of the wound of these organisms under treatment.

The predominant organism among the secondary invaders was a Gram-negative, encapsulated bacillus, which fermented glucose, maltose, sucrose and galactose with the formation of acid without gas. Its classification was not determined, but the author places it in the Friedländer group.

The sera of these patients often contained agglutinin for *Streptococcus pyogenes* in titers as high as 1:3200.—S. B-J.

1719. *An Epidemic of Pneumonic Plague*. W. H. KELLOGG. Am. J. Pub. Health, Concord, 1920, 10, 599-605.

The third epidemic of pneumonic plague occurred in Oakland, Cal, in Aug. and Sept., 1919, but was checked by adoption of measures of isolation. The endemic prevalence of plague among ground squirrels of California constitutes a permanent menace to the whole United States.—M. C. P.

1720. *Untersuchungen in der Erkältungsfrage. (The Problem of "Catching Colds.")* H. SCHADE. München. med. Wehnschr., 1920, 67, 449-454.

The author considers the various physiological phenomena coincident to the process of 'catching cold.' A reduction in immunity is also evident in the process. The effect of temperature (cooling) alone is much more important than one would believe at first thought.—B. C.

## INFLUENZA

(See also Numbers 1663, 1824, 1885)

1721. *Studies in Influenza and Pneumonia. Study V. Observations on the Bacteriology and Certain Clinical Features of Influenza and Influenzal Pneumonia*. E. C. ROSENOW. J. Infect. Dis., Chicago, 1920, 26, 469-491.

"Green-producing streptococci (including pneumococci)" were found to occur in about 96 per cent of a large number of cases of influenza and influenzal pneumonia during the four waves of the epidemic in Rochester, Minn., in 1918 and 1919. Human blood agar, oleate media and vitamin agar were used in these cultures. The influenza bacillus was found in only 16 per cent of the cases. Hemolytic streptococci and staphylococci were more numerous during the latter part of the outbreaks and in the late stages of the disease. Extraordinary mutations are reported. The cultures of green-producing streptococci at times changed abruptly to hemolytic streptococci and in 5 subcultures yielded staphylococci.

The green-producing streptococcus possessed considerable virulence for guinea pigs. Tables are presented showing that the peculiar infecting power of streptococci from influenza were not correlative with their ability to ferment certain carbohydrates, as the fermentation reactions varied even with individual strains.

The studies reported in this series of papers were made to discover a possible relationship between the epidemic of influenza and the appearance of variants or mutation forms of organisms commonly present in the respiratory tract of man.—S. B-J.

1722. *Studies in Influenza and Pneumonia. VI. The Leukocytic Reaction in Influenza and Influenzal Pneumonia*. E. C. ROSENOW. J. Infect. Dis., Chicago, 1920, 26, 492-503.

The green-producing streptococci and other bacteria from influenza when injected intraperitoneally into guinea pigs produced a leucopenia comparable to that of influenza in man. Composite leucocyte counts of many cases of influenza and of many animals thus inoculated are compared and reproduced in the graphs which illustrate this paper. The average diminution of the leucocyte count in guinea pigs was 58 per cent.

Filtrates of streptococci from influenza on injection into guinea pigs produced leucopenia. Such cultures are, therefore, considered to contain a leucotoxin. This finding is thought to indicate that the reduction of leucocytes following injection of the material from patients with influenza may not be due to an unknown virus, but to peculiar properties of the streptococci or other bacteria at hand in this disease.—S. B-J.

**1783. *Studies in Influenza and Pneumonia. VII. A Study of the Effects Following the Injection of Bacteria Found in Influenza, in Normal Throats, in Simple Nasopharyngitis, and in Lobar Pneumonia.*** E. C. ROSENOW. J. Infect. Dis., Chicago, 1920, 26, 504-556.

The results of subcutaneous, intraperitoneal, intravenous and intratracheal injections show that the bacteria, particularly green-producing streptococci isolated constantly in epidemic influenza possess high and peculiar invasive powers. Leucopenia followed injections of these streptococci. In the guinea pig, an emphysematous hemorrhagic lung, similar to that seen in anaphylaxis, was caused by intratracheal injections of cultures of these streptococci. The "anaphylatoxin-like" substance was produced only by recently isolated organisms, and disappeared after several subcultures.

Experiments with Berkefeld filtrates of cultures showed that the green-producing streptococcus might in one stage be sufficiently small to pass through the pores of filters which retained *B. prodigiosus*. Such filtrates produced bronchopneumonia when injected intratracheally into guinea pigs.

Pneumonia developed by contact when infected and normal guinea pigs were placed in the same cages, and green-producing streptococci were isolated from the lesions in the contact cases.

This voluminous paper contains detailed protocols, an account of the technic of intratracheal injection of guinea pigs, bacteriological and pathological descriptions, and sections reporting control inoculations with pneumococci and bacteria from normal throats and from cases of simple nasopharyngitis.

The author concludes that through injections of the green-producing streptococcus of influenza, the general picture and pathological state of influenza as seen in man has been reproduced in guinea pigs.—S. B-J.

**1784. *Studies in Influenza and Pneumonia. Study VIII. Experiments on the Etiology of Gastro-Intestinal Influenza.*** E. C. ROSENOW. J. Infect. Dis., Chicago, 1920, 26, 557-566.

From two cases of intestinal influenza, characterized by abdominal pain and a bloody mucous diarrhea, green-producing diplo-streptococci were isolated in abundance. One of these cases was fatal, and the organisms were seen in and cultivated from the hemorrhagic ulcerations of the stomach and intestine. When cultures of these strains of the streptococcus were injected by rectum or intraperitoneally into guinea pigs a condition similar to the disease in man was produced. The animals developed slight diarrhea, and when killed by chloroform, usually 24 hours after the inoculation, showed hemorrhagic ulcerative gastroenteritis and pancreatitis. The organisms were found in the lesions and were readily recovered in culture. The experiments of this study suggest that there is a true gastrointestinal influenza and that green-producing streptococci similar to those isolated from the respiratory tract are the chief cause of the enteritis.—S. B-J.

**1785. *Studies in Influenza and Pneumonia. IX. Changes in the Green-Producing Streptococcus Induced by Successive Animal Passage and Their Significance in Epidemic Influenza.*** E. C. ROSENOW. J. Infect. Dis., Chicago, 1920, 26, 567-596.

The virulence of the green-producing streptococcus from influenza increased for one or two successive intratracheal injections of this organism and on further animal passage progressively diminished. Numerous experiments on animals, of which protocols are given, show that at the height of virulence this streptococcus induces, on intratracheal injection, cyanosis, leucopenia, hemorrhagic pulmonary edema, necrosis of the alveolar epithelium and dilated emphysematous lungs. As the virulence decreases, on subsequent animal passage (at about the fifth or sixth passage), the leucopenia becomes less marked, and the pulmonary lesions and mortality diminish. In the human infections in the epidemic a similar sequence of events was noted. This experimental evidence is thought to show that the change in the type of influenza early and late in an epidemic, the rise and fall in mortality rate, and the lesser tendency to leucopenia late in the epidemic may be due in the main to changes in the virulence of this green-producing streptococcus of influenza.—S. B-J.

**1786. *Studies in Influenza and Pneumonia. Study X. The Immunologic Properties of the Green-Producing Streptococci from Influenza.*** E. C. ROSENOW. J. Infect. Dis., Chicago, 1920, 26, 597-613.

A monovalent serum was prepared by injecting a horse with increasing doses of the green-producing streptococcus isolated from the blood after death in a case of influenzal pneumonia. Many strains of the green-producing streptococcus from influenza were tested against this serum, normal horse serum, antihemolytic streptococcus serum and the typical pneumococcus serums. The agglutination of these strains of streptococci by all serums, except the monovalent one, did not exceed 25 per cent of the strains, while the monovalent serum, specific for the green-producing streptococcus agglutinated 60 to 75 per cent of the strains of this organism.

During the experiments wide variations were found in the cultures, the green-producing streptococcus changing suddenly to a staphylococcus or hemolytic streptococcus or pneumococcus. The mutants did not possess the antigenic qualities of the original organism, and the monovalent serum which formerly agglutinated the influenza coccus failed to agglutinate the metamorphosed subcultures.

The mutation of these members of the pneumococcus-streptococcus group is suggested as an important factor in the pathogenesis of influenza.—S. B-J.

1727. *Studies in Influenza and Pneumonia. XI. Therapeutic Effects of a Monovalent Anti-streptococcus Serum in Influenza and Influenzal Pneumonia.* E. C. ROSENOW. J. Infect. Dis., Chicago, 1920, 26, 614-622.

Twelve cases of influenza and influenzal pneumonia were treated by intravenous injections of 25 cc. to 100 cc. of the serum of a horse immunized to one strain of the green-producing streptococcus of influenza. These patients are grouped as follows:

Group I. (Four patients.) The sputum of all contained predominating numbers of green-producing streptococci which were agglutinated by the monovalent serum. Three of these patients were in the first influenzal attack, the fourth in a relapse. All four showed marked improvement and recovered promptly following the serum treatment. None of these patients developed outspoken signs of pneumonia.

Group II. (Three patients.) All showed improvement immediately after the injection of serum, during the first stage of the illness, when the green-producing streptococci from the sputum were agglutinated by the monovalent serum. Later the patients developed bronchopneumonia, due to green-producing streptococci which were not agglutinated by this serum. Two of these patients died.

Group III. (Five patients.) No improvement followed the injection of the serum. The streptococci from the sputum of these patients were not agglutinated by the serum. These patients died.—S. B-J.

1728. *The Experimental Production of Pneumonia with the Influenza Bacillus of Pfeiffer.* RALPH H. MAJOR. J. Med. Research, Bost., 1920, 41, 373-386.

The results of the experiments undertaken in this study indicate that the invasive powers of *B. influenzae* are limited. When the organisms are injected intravenously the effects produced are to be explained by a toxic action produced by multiplication and spread through the blood stream. In no cases were the bacilli recovered from the blood cultures in animals which had been injected intravenously with influenza bacilli.

Introduction of *B. influenzae* into the trachea was successful in producing bronchopneumonia. The bronchopneumonic patches in the lungs were small, few in number and confined to the hilus. The location of these areas also suggested a local direct action of the masses of bacteria, with little extension to other portions of the lungs.

A preliminary irritation of the respiratory tract with chlorine gas permitted an extensive invasion with influenza bacilli injected intravenously or intratracheally. The pathological changes produced in the lungs were striking and intense in degree, and resembled the lungs in fatal cases of human influenza. In the majority of these cases influenza bacilli were grown from the lungs in pure culture.—A. C. E.

1729. *Einige Erfahrungen über Grippe-Pneumonien. (Influenzal Pneumonias.)* TREUPEL AND KATSER-PETERSEN. München. med. Wchnschr., 1920, 67, 686-688.

A certain immunity remains after an attack of influenza. Influenzal pneumonia is differentiated from the ordinary bronchopneumonia by its marked septic and toxic effects. In addition to pneumococci and other pathogens, the sputum also contains elastic fibers. Another characteristic is the retarded lysis occurring in influenzal pneumonia.—B. C.

1730. *Observations on Green Producing Cocci of Influenza.* R. TUNNICLIFF. J. Infect. Dis., Chicago, 1920, 26, 405-417.

A large number of strains of the peculiar "green producing" coccus isolated by Mather and others during the influenza epidemic of 1918 were studied to determine the relationship of this organism to *Streptococcus viridans* and the pneumococci. Cultural and morphological characteristics of the coccus are common to both streptococcal and pneumococcal groups. Some strains are insoluble in bile, have a capsule and ferment inulin, other strains, soluble in bile, do not ferment inulin. Its individuality, however, is made apparent by serological reactions. This coccus is chiefly agglutinated and opsonized by its homologous serum, and nearly all the strains from cases of influenza fall into a serological grouping in spite of somewhat varied cultural reactions. The organism is referred to as the "influenza coccus."—S. B-J.

1731. *Non-Lactose Fermenting Organisms from the Feces of Influenza Patients.* N. P. SHERWOOD, C. M. DOWNS AND J. B. McNAUGHT. J. Infect. Dis., Chicago, 1920, 26, 16-22.

Bacteriological examination of the feces of 32 patients with "influenza" showed the presence of *B. typhosus* in 3 and of enteritidis-like organisms in 17 others. Six cases of other infections, studied as controls, did not show these organisms. Where *B. typhosus* was present, it was thought to indicate influenza in a typhoid carrier or mild typhoid fever resembling influenza.

No hypothesis is advanced to account for the occurrence of the enteritidis-like organisms. Agglutination and absorption tests showed that these organisms were identical with the laboratory strain of *B. enteritidis*.

The occurrence of *B. enteritidis* in the feces of these cases, if not related to influenza, has a bearing on the interpretation of stool cultures in epidemics of food poisoning. It shows the need of extensive survey as a control of gastro-intestinal bacteriology.—S. B-J.

1732. *Bacillus influenzae in Normal and Pathologic Throats*. LLOYD ARNOLD. J. Lab. & Clin. Med., St. Louis, 1920, 5, 652-656.

The author, after a review of the literature and a brief summary of the methods of isolation of the influenza bacillus, describes his technic and experiments.

He found influenza bacilli present in 35 per cent of normal throats, in 77.7 per cent of cases of acute rhinitis and pharyngitis and in 86.5 per cent of the cases in the 1920 epidemic of influenza in Nashville. He also found that the organism in nasal secretions, when directly exposed to the air, is not viable after 10 hours, but when exposed to light if drying is prevented, it is viable for 24 hours.

Avery's sodium oleate blood agar plates, when pains were taken in the adjustment of the pH value of the medium proved very satisfactory for isolating *B. influenzae*.—F. W. H.

1733. *Bakteriologische Befunde bei Influenza. (Bacteriological Findings in Influenza.)* FELIX E. R. LOEWENHARDT. Deutsche med. Wchnschr., 1920, 46, 794-795.

Of 285 cases of clinical influenza, the Pfeiffer bacillus was demonstrated in 66 per cent of them (57 per cent in autopsy material, 76 per cent in sputums, 52 per cent in throat smears). Direct study of the material in the sickroom resulted in the finding of influenza bacilli in 91 per cent of throat smears.—B. C.

1734. *Bacteriology of Influenza*. M. E. STEINBERG. Northwest Med., Seattle, 1920, 19, 18-20.

Throat, nasal, sputum and blood cultures were made.

The bronchial secretions showed *B. influenzae* in 7 per cent of the cases studied while the throat gave 11 per cent and nasal swabbings about the same. The 20 blood cultures made gave negative results. *B. influenzae* was isolated from the sphenoidal sinus in two cases.—C. P. B.

1735. *Zur Verhütung und Behandlung der Grippe. (Prevention and Treatment of Influenza.)* J. SCHWALBE. Deutsche med. Wchnschr., 1920, 46, 326-327.

This is a resumé of the opinions expressed by numerous clinicians. It is the almost universal opinion that influenza is spread by contact between persons. Most clinicians believe that the only way to check the spread of the epidemic is to protect the healthy from becoming infected. Internal medication does not seem to have any effect in preventing secondary pneumonia, neither has influenza serum shown any efficacy in the hands of many. Serum from convalescents has, however, shown strikingly favorable effects on the course of the disease.—B. C.

1736. *Beiträge zur Serumbehandlung der Influenza. (Serum Treatment in Influenza.)* E. FÖLDES AND K. HAJOS. Wien. klin. Wchnschr., 1920, 33, 360-361.

The effect of serum administration in influenza is not a specific antitoxic one, but rather a type of hetero-protein therapy. Subcutaneous injection of 30 to 50 cc. of the serum was administered, sometimes to be repeated 3 or 4 days later. Usually there resulted a slight degree of improvement in the patient's condition. A clear interpretation of the results is difficult.—B. C.

1737. *Therapeutische Erfahrungen aus der diesjährigen Grippe-epidemie. (Therapeutic Results in the present Influenza Epidemic.)* ULRICH FRIEDEMANN. Deutsche med. Wchnschr., 1920, 46, 283-285.

In some cases normal horse serum seemed to affect the course of the disease favorably. In the absence of any other means, and in view of its harmlessness, influenza antiserum should be included in the treatment of epidemic influenza until more is known.—B. C.

1738. *Zur Grippeprophylaxe. (Prophylaxis in Influenza.)* J. PLESCH. Deutsche med. Wchnschr., 1920, 46, 520.

During influenza epidemics it was observed that laboratory workers exposed to iodine fumes were immune to the infection. This suggested the use of iodine as a prophylactic. The tincture is poured in a thin layer on a plate, the solvent allowed to evaporate off, and the iodine fumes then inhaled for a short period. Such an "iodine-plate" is suggested for the sick room in infectious diseases.—B. C.

1739. *Ein Rückblick auf die Influenza vom Jahre 1918. (A Review of Influenza in 1918.)* F. RAFFELT. Wien. klin. Wchnschr., 1920, 33, 334-336.

A general review of the situation is given with an attempt at classification of the symptoms.—B. C.



1740. *Zur Pathogenese der Grippe. (The Pathogenesis of Influenza.)* RICHARD WIESNER. Wien. klin. Wchnschr., 1920, 33, 531-535.

The virus of influenza produces an acute catarrhal inflammation in the mucosa of the upper respiratory tract. Here the body puts up its first defense, and from this point the toxin travels to the nervous system, producing special damage to the parenchymal cells in the nuclear region. This damage is at the bottom of the various symptoms observed and the complications that follow; the disturbances in innervation preparing the way for secondary invaders to do their damage unhindered.—B. C.

### ENCEPHALITIS LETHARGICA

1741. *Acute Infectious Myoclonus Multiplex and Epidemic Myoclonus Multiplex (Epidemic Encephalitis).* J. RAMSAY HUNT. J. Am. M. Ass., Chicago, 1920, 75, 713.

Shooting pains beginning either in the upper or lower extremities are the first abrupt symptoms of the disease. In the observed cases the pains were limited to the trunk and extremities and were not manifested in the sensory distribution of the cranial nerves. Muscle jerks and twittings followed in the wake of the pains either immediately or after a few days. Acute infectious myoclonus multiplex may be regarded as a definite clinical type of acute neural infection and the epidemic form as the epidemic of lethargic encephalitis. The relation of the sporadic to the epidemic type is still problematic. The etiologic organism seems to have acquired an affinity for certain tissues of the nervous system.—P. G. H.

1742. *Bakteriologischer Befund bei Encephalitis lethargica. (Bacteriological Findings in Lethargic Encephalitis.)* WALDEMAR LOEWENTHAL. Deutsche med. Wchnschr., 1920, 46, 289-290.

Cultures from the spleen of a fatal case of lethargic encephalitis produced colonies of an organism that was morphologically similar to the Pfeiffer influenza bacillus.—B. C.

1743. *Lange Reaction in Encephalitis Lethargica.* I. C. BRILL AND R. L. BENSON. J. Lab. & Clin. M., St. Louis, 1920, 5, 613-614.

In a study of 13 cases the authors observed a reaction in the tabetic zone, but one weaker than the usual luetic curve. They do not consider this an absolutely diagnostic feature but hope it may prove of service as an additional laboratory test in cases whose symptoms suggest encephalitis lethargica.—F. W. H.

1744. *Zur Vergleichenden Pathologie der Encephalitis nebst kritischen Bemerkungen zur Encephalitis lethargica (epidemica)-Diagnose. (Comparative Pathology and Critical Remarks on the Diagnosis of Epidemic Lethargic Encephalitis.)* G. HIRSCH. Berl. klin. Wchnschr., 1920, 57, 605-607.

It is claimed that though the clinical pictures of encephalitis are essentially the same, their etiology may be entirely different. The clinical and anatomical findings suggest the following course of the disease: (1) The nervous tissue elements are damaged by the toxic products of the infection; (2) upon this is superposed the effect of the products of inflammation; (3) then occurs increase in intracranial pressure; and (4) interference with the lymphatic drainage.—B. C.

1745. *Ueber Rückenmarksveränderungen bei Encephalitis lethargica. (Changes in the Spinal Cord in Lethargic Encephalitis.)* WERNER GERLACH. Berl. klin. Wchnschr., 1920, 57, 585-589.

This pathological study of the damage to the different portions of the spinal cord in lethargic encephalitis accounts for the great variety of symptoms observed in different patients. Depending upon the site of localization of the virus in the cord, one set of symptoms may be more prominent than others. Two cases are described in detail, in which it appears that the most marked primary change was observed in the perivascular regions of the cord.—B. C.

1746. *Zur Kenntnis der klinischen Erscheinungstypen und zur Prognose der jetzigen Encephalitis-epidemie. (Clinical Types and Prognosis in the present Encephalitis Epidemic.)* JOSEF GERSTMANN. Wien. klin. Wchnschr., 1920, 33, 165-166.

In the present epidemic there are noted 4 types of encephalitis (lethargica, choreatica, psychotica and myoclonica) which are apparently of a single etiology. They all have a high fatality rate.—B. C.

1747. *Die jetzt in Wien herrschende Nervengrippe; Encephalitis, Polyneuritis und andere Formen. (The Neuro-influenza now Prevalent in Vienna: Encephalitis, Polyneuritis and other Forms.)* HERMANN SCHLESINGER. Wien. klin. Wchnschr., 1920, 33, 358-360.

The author discusses the various changing clinical features of the current epidemic.—B. C.

1748. *Spätfolgen der Encephalitis nach Grippe. (Encephalitic Sequelae of Influenza.)* O. SPEIDEL. München. med. Wchnschr., 1920, 67, 630-632.

There must be a causal relationship between influenza and the encephalitides that follow. Nona followed the influenza epidemic of 1890, encephalitis lethargica followed that of 1919 and now encephalitis choreatica comes in the wake of the 1920 epidemic. Etiologically, encephalitis is not a disease due to a specific organism so far as present knowledge goes.—B. C.

1749. *Zur Frage der Encephalitis lethargica. (Lethargic Encephalitis.)* KARL GROSZ. Wien. klin. Wchnschr., 1920, 33, 192-195.

The author gives a detailed clinical and pathological description of three cases.—B. C.

1750. *Zur Klinik der Encephalitis lethargica. (Lethargic Encephalitis.)* GEORG STIEFLER. Wien. klin. Wchnschr., 1920, 33, 286-289.

This is a clinical report of cases encountered. The encephalitis epidemic occurred in the last week of January and the first week of February (1920) and preceded, by a short interval, the extensive spread of influenza.—B. C.

1751. *Zur Frage der epidemischen Encephalitis. (Epidemic Encephalitis.)* WILHELM SPÄT. Wien. klin. Wchnschr., 1920, 33, 289-291.

Attention is called to the numerous manifestations and the complex symptomatology of the disease in its early stages. The prognosis is grave, but with early recognition, the case fatality rate may be kept very low.—B. C.

1752. *Encephalitis lethargica Epidemie von 1920. (The Lethargic Encephalitis Epidemic of 1920.)* C. ENCOMO. Wien. klin. Wchnschr., 1920, 33, 329-331; 361-364.

The author gives a detailed account of the clinical features of lethargic encephalitis as it appeared in the 1920 epidemic. The epidemic was characterized by the toxic components of the disease, the hyperkinetic and tabetic form of the symptoms, the poliomyelitic spread, and its combination with influenza.—B. C.

1753. *Die gegenwärtige Encephalitis-epidemie. (The Present Encephalitis Epidemic.)* G. L. DREYFUS. München. med. Wchnschr., 1920, 67, 538-541.

The author gives a survey of the various clinical features of the different types of encephalitis encountered in the epidemic. The spinal fluid is usually under pressure and precipitates colloidal gold in a curve midway between that of syphilitic and meningitic spinal fluids. The pathogenesis of the disease is still obscure. Influenza was present in many cases, but could be excluded in as many others.—B. C.

1754. *Zur Symptomatologie der neuro-zerebralen Grippeformen. (The Symptomatology of Neuro-cerebral Types of Influenza.)* ERNST W. HEISS. München. med. Wchnschr., 1920, 67, 663-664.

The various polyneuritic symptoms are briefly described.—B. C.

1755. *Zur Frage der Encephalitis epidemica. (The Epidemic Encephalitis Problem.)* WALTER COHN AND ILSE LAUBER. München. med. Wchnschr., 1920, 67, 688-690.

The symptoms found in different cases are so various that giving each type a name is cumbersome. The group name (meningo) encephalomyelitis epidemica should answer most descriptions. From the blood of one case there was isolated an organism which is considered identical with the *Streptococcus pleomorphus* which Wiesner found in lethargic encephalitis. This organism is insoluble in bile salts. Thus far, animal experiments have been negative with it.—B. C.

1756. *Ueber Encephalitis epidemica lethargica. (Epidemic Lethargic Encephalitis.)* F. MORITZ. Münch. med. Wchnschr., 1920, 67, 711-714.

The author discusses the different clinical features of the disease. Presence of functional disturbances of the eyes is noted as one of the most common and constant diagnostic signs.—B. C.

1757. *Ueber das plötzliche gehäufte Auftreten schwerer choreiformer Erkrankungen in Wien, I, II. Encephalitis choreiformis epidemica. (Choreiform Encephalitis Occurring in Sudden Epidemic Form in Vienna.)* LUDWIG DIMITZ. Wien. klin. Wchnschr., 1920, 33, 163-165; 231-234.

The clinical picture of an epidemic is described; non-purulent hemorrhagic encephalitis involving a large portion of the central nervous system, and by preference, but not exclusively, attacking the gray matter. The disease resembles chorea in certain respects and is considered distinct from lethargic encephalitis. Its prevalence along with recrudescences of influenza and lethargic encephalitis is noted. Somnolence characterizes encephalitis of the lethargic type, while motor symptoms stand out in the choreiform type.—B. C.

1758. *Encephalitis epidemica choreatica. (Epidemic Encephalitis Choreatica.)* OSSIAN OEHMIG. München. med. Wehnschr., 1920, 67, 660-663.

Though the peak of the influenza epidemic has passed, cases of encephalitis are still numerous, eleven of which are described in detail.—B. C.

1759. *Scölafkrankheit, Grippe-Enzephalitis, Encephalitis comatosa. (Sleeping Sickness, Grip-Encephalitis, Encephalitis Comatosa.)* CARL KLIENECKER. Deutsche med. Wehnschr., 1920, 46, 654-655.

A brief discussion of the symptomatology and epidemiology of these diseases is given.—B. C.

1760. *Ueber Encephalitis epidemica (Encephalitis lethargica). (Epidemic Lethargic Encephalitis.)* ADOLPH STRÜMPF. Deutsche med. Wehnschr., 1920, 46, 705-707.

A general discussion of the epidemiology and symptomatology of the disease.—B. C.

1761. *Zur Frage der epidemisch auftretenden Enzephalitis. (Epidemic Encephalitis.)* DR. HOESTERMANN. Deutsche med. Wehnschr., 1920, 46, 707-708.

A discussion of the clinical characteristics in which the picture of a marked hemorrhagic diathesis was the outstanding feature.—B. C.

1762. *Die Augensymptome bei der Encephalitis lethargica. (Ocular Symptoms in Lethargic Encephalitis.)* RICHARD CORDS. München. med. Wehnschr., 1920, 67, 627-629.

As a result of the diffuse spread of the pathological changes various eye symptoms may be noted, but conclusions as to localization are impossible.—B. C.

1763. *Untersuchungen des Hör- und Gleichgewichtsapparates bei Encephalitis lethargica. (The Hearing and Semi-circular Apparatus during Lethargic Encephalitis.)* KARL GRAHÉ. München. med. Wehnschr., 1920, 67, 629-630.

Disturbances of the cochlear and vestibular apparatus are frequently noted in this disease. Judging from characteristics of the symptoms, it seems certain that temporary central damage is the cause, rather than peripheral change.—B. C.

1764. *Ein Fall von Encephalitis lethargica in Ostpreussen. (A Case of Lethargic Encephalitis in Eastern Prussia.)* K. KÖTSCHAU. München. med. Wehnschr., 1920, 67, 542-543.

The author describes a fatal case in which it is suspected that influenza played a part.—B. C.

## TUBERCULOSIS

(See also Numbers 1534, 1613, 1614, 1615, 1616, 1668, 1699, 1700, 1813, 1821, 1822, 1881, 1882, 1883, 1884, 1885, 1886, 1887, 1888, 1889, 1890, 1891, 1892, 1901)

1765. *Les acquisitions récentes de la médecine expérimentale dont il faut tenir compte désormais dans nos efforts de lutte antituberculeuse. (The Recent Achievements of Experimental Medicine which may be Utilized Hereafter in our Struggle against Tuberculosis.)* A. CALMETTE. Rec. de méd. vét., Par., 1919, 95, 665-671.

A general article on the subject indicated.—W. G.

1766. *Studies on Tuberculous Infection. VI. Tuberculosis in the Guinea Pig after Subcutaneous Injection, with Particular Reference to the Tracheo-Bronchial Lymph Nodes.* ALLEN K. KRAUSE. Am. Rev. Tuberc., Balt., 1920, 4, 135-192.

An excellent description of the anatomy of the guinea pig is given. When inert foreign particles are injected subcutaneously a rapid local inflammatory process is set up, tending to localize and confine most of the material injected. Some particles are carried into adjacent lymphatics and thus centralwards. Intercalated lymph nodes arrest some of the particles, but some pass through them into the venous system and thence to the lungs. Some particles may lodge in the lungs in the smaller blood vessels, where they may remain *in situ* or be carried into the tissue spaces and thence again into the lymphatics and the intrapulmonary lymphoid tissue or hilum nodes; others may pass through the lungs to the several organs of the body. The spleen receives particles by way of the splenic artery. In case they are fixed in the spleen, they may remain in the lumina of the smaller vessels or be carried into the lymphatics, thence to the splenic node, thoracic duct, venous system and lungs.

If they pass directly through the spleen they go to the liver by the hepatic artery and portal vein. They may remain in the liver capillaries, arterioles and venuoles, some of which may be carried into the lymphatic system, where they will remain or be carried back to the venous system and lungs. They may pass directly through the liver to the lungs.

When massive doses of tubercle bacilli are injected in the groin of the guinea pig, they are carried rapidly throughout the body. At four days they have reached the iliac node, the spleen, the lungs and tracheo-bronchial nodes. There are more bacilli on the iliac node on the inoculated side than in spleen, lungs or tracheo-bronchial nodes, and more bacilli in the tracheo-bronchial nodes than in both lungs which they drain.

The first definite gross lesions appear in the superficial inguinal nodes and the right iliac node at 6 days, the paraortic nodes retrosternal nodes at 18 days, the tracheo-bronchial nodes at 20 days. During the 26 days of the first part of the experiment, the lungs never exhibited lesions.

Lesions commonly exist in tracheo-bronchial nodes without lesions in the lungs. The amount of involvement of the former is directly related to the amount of tubercle present anywhere in the body. The condition of tracheo-bronchial nodes usually reflects that of the spleen.—T. G. H.

1767. *Studies on Tuberculous Infection. VII. Some Factors that Influence the Development of Tubercle in the Lymph Nodes of the Guinea Pig.* ALLEN K. KRAUSE. *Am. Rev. Tuberc.*, Balt., 1920, 4, 193-200.

"In the guinea pig the existence of tubercle in a lymph node is contingent on the occurrence of a lesion at a point peripheral to the node.

"The progression or retrogression of tubercle in this animal's lymph nodes is largely dependent on the progression or retrogression of the peripheral foci."—T. G. H.

1768. *Zur Tuberkuloseinfektion. (Tuberculosis Infection.)* PEYRER. *Wien. klin. Wchnschr.*, 1920, 33, 488-490.

A child became infected with tuberculosis inside of 36 hours. On the 7th to 8th day she reacted toward tuberculin, but in large doses (100 mgm.). No other symptoms of the disease were observed.—B. C.

1769. *Ueber offene und geschlossene Lungentuberkulose. (Open and Closed Pulmonary Tuberculosis.)* FRANZ HAMBURGER. *München. med. Wchnschr.*, 1920, 67, 659-660.

What do we understand by the terms open, closed, active and inactive tuberculosis? Is the presence or absence of tubercle bacilli in the sputum, or of a tuberculin test to be the criterion? The author makes a plea for an exact definition and a universal nomenclature.—B. C.

1770. *Les formes ouvertes de la tuberculose chez les carnivores domestiques. (Open Tuberculosis of the Domestic Carnivora.)* G. PETIT. *Rec. de méd. vét., Par.*, 1919, 95, 674-677.

The author concludes that human tuberculosis is easily transmitted to the dog and cat, both experimentally and naturally and he admits and fears that it may be transmitted from these animals to man. He would consider as suspects dogs or cats that become emaciated, cough, have diarrhea or have on the face or neck ulcers that resist healing.—W. G.

1771. *Die anatomische Formen der Lungentuberkulose. (The Anatomical Forms of Tuberculosis.)* ALEXANDER SCHMINCKE. *Münch. med. Wchnschr.*, 1920, 67, 407-409.

In this lecture, the author considers pulmonary tuberculosis under three heads: miliary, focal and confluent tuberculosis. The anatomical changes in each of these types are described.—B. C.

1772. *Die durch die Kriegsverhältnisse gesteigerte Tuberkulosesterblichkeit vom Standpunkte der Rassehygiene. (The Accelerated Death Rate from Tuberculosis due to the War Viewed from the Public Health Standpoint.)* E. NEUMANN. *Deutsche med. Wchnschr.*, 1920, 46, 463.

Deaths from tuberculosis in Germany have risen from 40,000 in 1913 to 76,000 in 1918, the increase being mainly in adult females. This is ascribed to a state of reduced resistance consequent upon the hardships inflicted by the war. The effect of this situation upon the German public health is evident.—B. C.

1773. *Suspected Pulmonary Tuberculosis in Children of School Age.* B. C. STEVENS AND T. O. SURREY. *Pub. Health, Lond.*, 1920, 33, 197-201.

An analysis of 359 dispensary cases with general suggestions for treatment.—J. B.

1774. *Ueber das Häufigerwerden der Lungentuberkulose mit zunehmendem Alter der Kinder. (The greater Incidence of Pulmonary Tuberculosis with increasing Age of Children.)* R. ZIMMERMANN. *Berl. klin. Wchnschr.*, 1920, 57, 562-563.

Examination of 150 children from 2 to 14 years old showed that severe pulmonary tuberculosis appeared rarely. Pulmonary symptoms became more frequent during school age, and were of greater significance with increasing age. Near puberty, the disease assumes the destructiveness characteristic for it in adults.—B. C.

1775. *Die Diagnostik der Kindertuberkulose. (Diagnosis of Tuberculosis in Children.)* PAUL GROSSER. *Deutsche med. Wchnschr.*, 1920, 46, 369-372.

This critical survey of the problem considers the various anatomical changes and alterations in immune reactions in tuberculous children. In elder children, a repeated Pirquet test is sufficient for diagnosis, for if it is negative, an active tuberculosis is in all probability to be excluded.

A negative result with a Pirquet and intracutaneous test shows (except during the incubation period in infants, cachexia, and the febrile phase of the acute infections), the absence of tuberculous infection; a positive result indicates that the body has been through a tuberculous infection, but does not show that it is now tuberculous.—B. C.

1776. *Die tuberkulöse Durchseuchung im Kindesalter, beurteilt nach Tuberkulinimpfungen in einer Mädchen-Mittelschule.* (*The Extent of Tuberculosis in Childhood, Judged by Tuberculin Test in a Girls' School.*) HILGERS AND GENTZEN. Deutsche med. Wchnschr., 1920, 46, 767.

In an urban school, an examination of 100 girls by the Pirquet and subcutaneous tuberculin tests yielded 80 per cent positive reactions. Whether the percentage is the same in country girls is a question that ought to be determined.—B. C.

1777. *Value of Tuberculin Cutaneous Test.* C. C. BROWNING. Northwest. Med., Seattle, 1919, 18, 230-232.

The method of applying the test is described in detail. The author divides his reaction into three types. He believes the reactions give a measure of antibodies, instead of being purely diagnostic and suggests a relationship between the sensitiveness of the individual to tuberculin and its use as a therapeutic agent.—C. P. B.

1778. *Jahreszeitliche Schwankungen der Tuberkulinempfindlichkeit.* (*Annual Variations in Tuberculin Sensitiveness.*) FRANZ HAMBURGER. München. med. Wchnschr., 1920, 67, 398-399.

The author observes in children a generally greater sensitiveness toward tuberculin in the spring than in autumn, which he couples with the increase in tuberculous infections during the colder months.—B. C.

1779. *Was bedeuten die kutanen Reaktionen mit Alt-tuberkulin und Partialantigenen für die Prognose der Tuberkulose.* (*The Significance of the Cutaneous Reaction with O. T. and Partial Antigens in the Prognosis of Tuberculosis.*) KAMMERER. München. med. Wchnschr., 1920, 67, 375-380.

A cutaneous tuberculin reaction is strong because much antibody is present which produces anaphylatoxin from the antigen introduced. It may be weak or absent because (a) in severe cases antibody is scarce or saturated by too much antigen; (b) very much is present and the antigen is thus very quickly split up into non-toxic products; (c) no tuberculosis, hence no antibody is present; (d) non-specific influences are active.

The use of partial antigens leads to as uncertain conclusions as does O. T. Where a positive reaction is obtained with whatever antigen, a favorable prognosis may be inferred.—B. C.

1780. *Zur Differentialdiagnose der akuten allgemeinen Miliartuberkulose.* (*The Differential Diagnosis of General Miliary Tuberculosis.*) H. VAN REY. Berl. klin. Wchnschr., 1920, 67, 558-562.

This is a detailed inquiry into the symptoms of acute miliary tuberculosis and their differentiation from other diseases. The laboratory demonstration of the organisms does not always help. The Pirquet reaction is often weakly positive or totally negative in miliary tuberculosis. X-ray pictures of the lungs usually enable one to differentiate pulmonary miliary tuberculosis from typhoid fever.—B. C.

1781. *Ergebnisse der Intrakutanimpfung nach Deyke-Much bei unspezifischer und Tuberkulintherapie.* (*Results of the Deyke-Much Intracutaneous Inoculation in Non-specific and Tuberculin Therapy.*) HANS T. SCHREUS. Berl. klin. Wchnschr., 1920, 67, 607-608.

Non-specific (helio-) therapy effects a rise in immunity as measured by partial antigens; while, on the other hand, simultaneous administration of tuberculin causes a weakening. It is possible that tuberculin, in spite of weakening the general immunity reaction, does actually effect a cure in local tuberculous processes. Whether this result in the face of the reduced immunity does not quickly disappear seems doubtful.—B. C.

1782. *Zur diagnostischen und prognostischen Bedeutung der kutanen Perlsucht-tuberkulinreaktion.* (*The Diagnostic and Prognostic Significance of the Cutaneous Bovine Tuberculin Reaction.*) INA SYNWOLDT. Deutsche med. Wchnschr., 1920, 46, 455-457.

Early tuberculous infection, not yet demonstrable by physical examination, will often yield a positive reaction when tested with the more sensitive bovine tuberculin, while it is still negative to human tuberculin. This is supported by the statistical evidence presented. Tests on the prognostic value of bovine tuberculin as compared with old tuberculin indicated that the former was a more sensitive indicator. Taken all in all, it appears that supplementing the usual old tuberculin test with a bovine tuberculin test will prove valuable from the diagnostic and the prognostic standpoints.—B. C.

1783. *Zur Pharmakologie des Tuberkulins.* (*The Pharmacology of Tuberculin.*) FRANZ HAMBURGER. München. med. Wchnschr., 1920, 67, 480-482.

The author restates the known general facts about the effects of tuberculin upon tuberculous and non-tuberculous persons.—B. C.

1784. *Epidemiologische und diagnostische Untersuchungen bei Lungentuberkulose. (Epidemiological and Diagnostic Studies of Pulmonary Tuberculosis.)* HANS CURSCHMANN. München. med. Wehnschr., 1920, 67, 623-625.

The views of numerous contemporary writers are collected to give a composite picture of the situation in Germany. The mortality from tuberculosis has greatly increased in all age groups. Figures are given showing in some cases a tuberculosis morbidity in children of 2.5 times that in pre-war years. This increase appears to be predominantly in cases of the bovine type. The causes are said to be the inadequate war dietary and the wretched housing and hygienic conditions. The influenza pandemic does not appear to have had any influence on the tuberculosis mortality or morbidity rates.—B. C.

1785. *Neuere Gesichtspunkte bei der Behandlung der Hodentuberkulose. (Recent Views on the Treatment of Tuberculosis of the Testes.)* H. ELS. Deutsche med. Wehnschr., 1920, 46, 451-453.

Eradication of the disease may be readily accomplished, if it has not advanced too far, by surgical removal of the infected organ.—B. C.

1786. *'Aufsteigende' oder 'absteigende' Ausbreitung der männlichen Genitaltuberkulose? (Ascending or Descending Spread of Male Genital Tuberculosis?)* C. KRAEMER. Deutsche med. Wehnschr., 1920, 46, 435.

Experiments of Baumgarten and Kraemer as well as clinical evidence of others seem to make clear that genital tuberculosis without exception propagates from the testes through the vas deferens to the prostate and so on, never in the reverse direction. Castration in cases of tuberculosis of the testes has been found very frequently to result in cure.—B. C.

1787. *Behandlung der Larynx-tuberkulose mit universellen Kohlenbogenlichtbädern. (Treatment of Laryngeal Tuberculosis with Universal Carbon Arc Light Baths.)* N. RE. BLEGVAD. Deutsche med. Wehnschr., 1920, 46, 621-624.

The naked patient is exposed daily in a reclining position to the rays of 4 powerful (20 amp.) carbon arcs, the length of exposure varying from 15 minutes during the first week to one hour in the fourth. The author reports on the results obtained by this treatment on 74 patients, of whom 22 did not improve or grew worse.—B. C.

1788. *Betrachtungen zur Strahlentherapie der chirurgischen Tuberkulose. (Heliotherapy in Surgical Tuberculosis.)* ELSNER AND OTTO STRAUSS. Deutsche med. Wehnschr., 1920, 46, 765-766.

The experience of Elsner indicates that the Friedmann treatment for tuberculosis of the bones and joints is decidedly effective as an adjunct to heliotherapy. Strauss on the other hand claims that sound orthopedic treatment alone will yield the results claimed for the Friedmann treatment.—B. C.

1789. *Die Bedeutung der Mischinfektion bei chirurgischer Tuberkulose. (The Significance of Mixed Infections in Surgical Tuberculosis.)* MAX JERUSALEM. Wien. klin. Wehnschr., 1920, 33, 471-473.

Bacteriological examination was made of the pus from definitely known tuberculous abscesses in 160 cases to determine the presence of pyogenic cocci. In 47 there were found one or more types of pyogenic organisms. *Staphylococcus pyogenes aureus* appeared 37 times, *Streptococcus pyogenes*, 14 times, and streptococci and staphylococci, 2 times. These are the organisms usually found in the ordinary surgical ward of a hospital, a fact which suggests that cases of tuberculous abscess be segregated from those suffering from various suppurative processes, because pyogenic organisms have a very damaging effect upon the condition of the tuberculous patient.—B. C.

1790. *Ueber die Bedeutung der Urochromogenreaktion für die Prognose der chirurgischen Tuberkulose. (The Significance of the Urochromogen Reaction in the Prognosis of Surgical Tuberculosis.)* KLARE. München. med. Wehnschr., 1920, 67, 635-636.

A continually positive urochromogen reaction in surgical tuberculosis is found to be indicative of a grave prognosis, and only radical intervention, like amputation where possible, can be of help.—B. C.

1791. *Die fleischhygienische Beurtheilung tuberkulöser Schlachthiere. (Judgment of Tuberculous Cattle from the Viewpoint of Meat Hygiene.)* MAX MÜLLER. München. med. Wehnschr., 1920, 67, 349-352.

The author discusses in detail the factors to be considered in judging meat from tuberculous animals as fit or unfit for human consumption. It is urged that judgment be based upon the degree of pathologic change actually found rather than upon evidence of the mode of extension of the disease. Three grades of tuberculous meat are suggested: unfit, of low value and fit for human consumption. In the severely tuberculous class are to be placed those with acute general miliary tuberculosis, and with tuberculous caseation and softening. Those with encapsulated or calcified tubercles are to be classed as moderately tuberculous. The severely tuberculous carcass, depending on its nutritive state would then be adjudged either as unfit or of least value for food; the moderately tuberculous carcass, as of low value or fit for food.—B. C.

## DISEASES OF CHILDREN

(See also Numbers 1774, 1775, 1776)

**1792. Reduction of Deaths from Infantile Diarrhea by Care of the Bowel Discharges of Infants.**

E. C. LEVY. Am. J. Pub. Health, Concord, 1920, 10, 400-404.

In the control of fatal infantile diarrhea, Levy used as his primary measure the proper disposal of the bowel discharges of all infants, sick and well. He worked upon the hypotheses that infection from case to case is the most important single factor in the spread of fatal infantile diarrhea and that the infecting organism is present in the bowel discharges. Following the inauguration of a publicity and educational campaign particularly through the medium of the nurses of the Health Department there was a rapid and marked decline in the death rate of 151 per 100,000 in 1911, the year preceding the initiation of this campaign, fell to 100 in 1912, and ultimately to 36 in 1919.—I. S. F.

**1793. Bacillary Dysentery in Children.** WILBURT C. DAVISON. Johns Hopkins Hosp. Bull., Balt., 1920, 31, 225-234.

An etiological, epidemiological and clinical study of 134 cases of ileocolitis controlled bacteriologically by an examination of a series of 63 cases of simple diarrhea and 100 normal children. In 80 per cent of cases of ileocolitis *B. dysenteriae*, was isolated, the Flexner type of infection being 8 times as frequent as the Shiga. Dysentery bacilli were not found in cases of ordinary diarrhea or in normal stools.

The author believes the infection is probably spread from stools to the food and mouths of others by flies and infected hands and that *B. morgan* No. 1, *B. pyocyaneus*, *B. welchii*, *B. proteus*, and *Streptococcus faecalis* have no etiological relationship to dysentery.—F. W. H.

**1794. The Skin Lesions in Measles.** F. B. MALLORY AND E. M. MEDLAR. J. Med. Research. Bost., 1920, 41, 327-348.

The primary lesions of measles is not known but all clinical evidence points to its arising as the result of an invasion of the upper respiratory tract. It seems evident that the causal agent gains access to the blood, causing a septicemia which antedates the exanthem and which results in multiple secondary lesions.

Each secondary lesion is due to a proliferative and exudative reaction in and around a small network of capillaries in the corium. These reactions are fully described and illustrated by seven plates.

The reaction is almost entirely on the part of the endothelial cells and leucocytes. The endothelial cells lining the capillaries in the lesions have swollen, finely granular cytoplasm. In the earlier lesions they often contain one to four, rarely more, minute intensely staining spherical bodies which vary a little in size. In the older lesions the bodies are fewer in number and usually more evident at the periphery of the lesion. Still later they disappear entirely. The nature of these bodies cannot be determined, but possibly they are cocci in various stages of digestion. They may be the cause of the disease.—A. C. E.

**1795. Ein Fall sehr später Scharlachinfektion? (A Case of Very Late Scarlet Fever Infection?)**

GOLLINER. Deutsche med. Wehnschr., 1920, 46, 799.

A patient with functional heart disease was removed for rest to a house in an unpopulated forest district. He used a couch put away 15 years previously after it had been occupied by a patient with scarlet fever. Within 6 days this patient developed typical scarlet fever. Since the disease was nowhere prevalent in the neighborhood, it is assumed that the virus had remained alive in the dust of the old couch for 15 years.—B. C.

**1796. Scharlach bei Neugeborenen und Säuglingen. (Scarlet Fever in the New-born and in Infants.)** G. DORNER. Deutsche med. Wehnschr., 1920, 46, 734-735.

Nursing infants in the early months of life are either totally immune to scarlet fever in the mother, or else are affected so slightly that it can hardly be detected. Several cases are cited to illustrate this fact.—B. C.

**1797. Beitrag zur Klinik des Erythema infectiosum. (Infectious Erythema.)** CARL COERPER. München. med. Wehnschr., 1920, 67, 456-457.

This is a disease attacking young children and having about the same degree of contagiousness as measles. The incubation period is about 2 weeks. Prodromal symptoms are not marked.—B. C.

**1798. Eine einfache Behandlungsweise der multiplen Abszesse (Furunkel) im Säuglingsalter. (A Simple Treatment for Furunculosis in Infancy.)** ST. ENGEL. Berl. klin. Wehnschr., 1920, 57, 611-612.

Investigations long ago revealed that multiple abscesses in infants were usually due to staphylococcus infection of the sebaceous glands. It is consequently suggested that inducing the flow of perspiration with the resulting washing out of the cocci should be efficacious in treatment. Strikingly favorable results are claimed for the following procedure: The infants are subjected for about 10 minutes to a bath of water at 40° to 42°C. This daily treatment is harmless and effective.—B. C.

1799. *Ueber die Symptomatologie und Aetiologie der Urticaria papulosa infantum (Strophulus), speziell deren Beziehung zur Erkrankung an Oxyuren.* (*The Symptomatology and Etiology of Urticaria papulosa infantum, Especially in Relation to Oxyuriasis.*) JOSEPH SCHÜTZ. München. med. Wehnschr., 1920, 67, 291-292.

The simultaneous occurrence of numerous cases of strophulus and oxyuriasis, the many cases of strophulus that had suffered previously or later from oxyuriasis, the parallel increase of both diseases in the same age groups since the war: all these facts point to a close etiologic relation between these diseases. Subsequently, the presence of oxyuria could be predicted in all cases of strophulus that appeared for treatment. Therapy against oxyuria produces relief from the skin affection.—B. C.

1800. *Säuglingsernährung mit sauer gewordener Milch.* (*Infant Feeding with Spontaneously Soured Milk.*) KLOTZ. München. med. Wehnschr., 1920, 67, 372.

The author believes that the danger of feeding spontaneously soured milk to infants is much overestimated. Clinical results seem to support this view. Owing to its scarcity, milk distributed in Germany in the past few years has been low in sanitary quality yet the usual toxicoses of infants was decreased rather than increased. General education in child hygiene is, however, admitted as being a large factor in the above case.—B. C.

## DERMATOLOGY

(See also Numbers 1794, 1798, 1799, 1802, 1803, 1817, 1818)

1801. *Bacillus of the Colon-Typhoid Group Isolated from a Case of Furunculosis.* W. W. OLIVER AND A. F. SCHWAB. J. Infect. Dis., Chicago, 1920, 26, 336-339.

An organism apparently belonging in the colon-typhoid group was isolated in pure culture from the pus of a furuncle. This bacillus produced acid but no gas by the fermentation of glucose, lactose, levulose, galactose, salicin, raffinose, sucrose, maltose, mannit and glycerin. On the surface of glucose agar slants no acid was produced, acidification occurring only in the stab cultures. Typhoid antiserum agglutinated the bacillus only in dilutions below 1-20. The organism was pathogenic for guinea pigs. Vaccine treatment, using this bacillus as the antigen, apparently cured the furunculosis of the patient from whom the organism was isolated.—S. B-J.

1802. *Ueber jahreszeitliche Schwankungen von Hautkrankheiten.* (*Annual Fluctuations of Skin Diseases.*) BETTMANN. München. med. Wehnschr., 1920, 67, 656-657.

"We can only very generally and indefinitely state that as a whole, cosmic and meteorological conditions in the spring influence the human body in a most complex way and produce labilising and sensitizing effects." It is suggested that these effects are due to endocrine conditions and their acceleration in the spring.—B. C.

1803. *Anthrax from Removing Hide from Mule.* RALPH KING. J. Am. M. Ass., Chicago, 1920, 76, 376.

A father and son removed the hide from a mule beneath whose skin watery fluid was found. Temperature developed after 48 hours and painful papules developed on the fingers. Anthrax bacilli were isolated from the lesions. Forty cc. of antianthrax serum were injected into the circulation in 2 doses 6 hours apart. Convalescence was slow. Scars were left but no other ill effects.—P. G. H.

1804. *Ueber Eigentümlichkeiten des Herpes Zoster.* (*Peculiarities of Herpes Zoster.*) ARTHUR STERN. Deutsche med. Wehnschr., 1920, 46, 832.

Herpes zoster, a disease usually occurring but once, tends in rare cases to periodic recurrences in conjunction with motor paralyses though not necessarily directly related to them,—all being simply symptoms of a general infection. There appear to exist certain zoster "equivalents" in the form of general symptoms of glandular swelling, motor paralyses, etc., without the presence of the zoster skin eruption.—B. C.

1805. *Die Ansteckungsfähigkeit des Herpes Zoster.* (*The Contagiousness of Herpes Zoster.*) ADOLF BACMEISTER. München. med. Wehnschr., 1920, 67, 721.

Herpes zoster has a mixed etiology. It may be due to bacterial damage in general infections, and it also may be a specific disease which is contagious and gives rise to the same set of symptoms. This latter type has an incubation period of 2 to 3 days as is shown by the cases cited. It seems to be highly contagious, and persons infected should be isolated.—B. C.

1806. *Die Pathologie und Therapie der Syphilis im Lichte der modernen Forschungsergebnisse.* (*The Pathology and Therapy of Syphilis in the Light of Modern Investigations.*) E. FINGER. Wien. klin. Wehnschr., 1920, 33, 373-377.

Next to the skin, the meninges are the most frequently invaded by *Treponema pallida*. The mesodermal tissue seems to be the only one able to initiate any defense against this invasion.—B. C.



1807. *Ueber Lichen trichophyticus. (Trichophyton Lichen.)* G. RIEHL. Wien. klin. Wehnschr., 1920, 33, 448.

The author describes a case in which there was a marked febrile reaction and an extensive spread of the exanthem over the body of the patient.—B. C.

## OPHTHALMOLOGY

(See Numbers 1598, 1752)

## OTOLOGY AND NOSE AND THROAT DISEASES

(See also Numbers 1787, 1913)

1808. *Hemolytic Streptococci in the Throat in Certain Acute Infectious Diseases.* A. OTTERBAEN. J. Infect. Dis., Chicago, 1920, 26, 23-28.

Hemolytic streptococci were found in the throats of 60 per cent of patients suffering with various infectious diseases, in 21 per cent of nurses, and 57 per cent of medical students. These streptococci were not virulent as far as indicated by the results of the inoculation of animals and by phagocytosis tests. The enrichment method of culture, using serum broth, yielded more positive cultures than the surface plating method in examinations for streptococci.—S. B-J.

1809. *Some Observations on Vincent's Angina. Report of Eighty Cases.* C. L. SHIELDS. Northwest Med., Seattle, 1920, 19, 45-46.

One hundred and fifty smears were made from normal throats without finding Vincent's organisms. Cultures and animal inoculations were unsatisfactory. Four cases are reported in detail. The author suggests a similarity to syphilis and that a positive Wassermann reaction in Vincent's angina may be no indication of lues.—C. P. B.

1810. *Zur Pathologie der Angina. (The Pathology of Angina.)* JOHANN FEIN. Wien. klin. Wehnschr., 1920, 33, 332-333.

The author suggests that affection of the glands in the tonsillar region should not be considered as a cause of general infection any more than as an end result. It is rather a coincident phenomenon in many cases. The anginous symptoms are in direct proportion to the quantity of adenoid tissue present.—B. C.

1811. *Erkrankungen des Rachens durch Diplococcus lanceolatus pneumoniae. (Throat Infection by Diplococcus pneumoniae.)* ADALBERT HEINDL. Wien. klin. Wehnschr., 1920, 33, 250-251.

An angina-like infection radiating from the tonsils is reported in 6 cases from which *Diplococcus pneumoniae* was found sometimes in pure culture. The organism appears to develop by preference in tissue that is already diseased.—B. C.

## ORAL BACTERIOLOGY

1812. *The Fate of Bacteria Introduced into the Upper Air Passages. IV. The Reaction of the Saliva.* ARTHUR L. BLOOMFIELD AND JOHN G. HUCK. Johns Hopkins Hosp. Bull., Balt., 1920, 31, 118-121.

A brief discussion of the physiology and chemistry of the mouth and nasal secretions followed by a description of the method employed for the determination of the hydrogen ion concentration of the saliva, various technical considerations and a tabulation of the results.

Freshly expectorated saliva from normal people gave a reaction varying between 6.0 and 7.3, with 80 per cent of the specimens falling between 6.6 and 7.1. The reactions varied in the same individual at different times without any relation to the time of day or to the ingestion of food or fluid. The use of mouth washes such as Dobell's solution caused an alteration in reaction for only 30 minutes. Administration of acid and alkali internally failed to change the reaction. There was no constant relation between the reaction and the type of disease in the group of patients which the authors had under observation but the variations in the hydrogen ion concentration covered a slightly greater range than in the normal person.—F. W. H.

1813. *Vincent's Spirochete and Haemorrhage in Pulmonary Tuberculosis.* A. N. SINCLAIR. Am. Rev. Tuberc., Balt., 1920, 4, 201-204.

"1. The presence of the spirochete of Vincent (and *B. fusiformis*) in the sputum makes hemorrhage a probable complication (76 per cent). The absence of the spirochete is against hemorrhage (36 per cent).

"2. Hemorrhage rarely occurs in incipient cases unless the spirochete is present (be the spirochete the cause of the hemorrhage or merely an indication of mixed infection, or other predisposing factors).

"3. An examination of the sputum in all cases, and particularly in incipient cases, for the presence of the spirochete, should be of great value when desiring to determine the amount of exercise (or other hemorrhage favoring factor) the patient may indulge in. When present, the patient should be treated as one in whom hemorrhage has already occurred; when absent considerably more latitude in exercise and general freedom may be allowed."—T. G. H.

1814. *Ueber die sogenannte Angina Plaut-Vincenti. (So-called Plaut-Vincent's Angina.)* ALFRED BRÜGGEMANN. München. med. Wchnschr., 1920, 67, 772-773.

Contrary to the general impression, Plaut-Vincent's angina is not confined to the tonsils but may extend to large areas of the oral mucosa. Fusiform bacilli and spirochetes are almost always found on examination of the ulcers, but whether they are etiologically connected with the disease is still a disputed question. The clinical symptoms are described in some detail.—B. C.

1815. *A Clinical and Bacteriological Study of Fusiform Bacillus Infection.* RALPH R. MELLON. N. York State J. M., N. Y., 1920, 20, 187-190.

The author reports the frequent finding of members of the trichomyces group, more especially in conditions of the upper respiratory tract. Chronic bronchitis was the most common type of case and this infection at times simulated tuberculosis. The author believes *B. fusiformis* and its congeners may play a more important part in disease than has been supposed, the results of blood cultures, especially in those cases giving positive immune reactions, being suggestive.—F. W. H.

1816. *Zur Frage der Häufigkeit der Angina Plaut-Vincenti. (The Prevalence of Plaut-Vincent's Angina.)* BIEROTTE. München. med. Wchnschr., 1920, 67, 542.

Vincent's angina occurs much more frequently than is suspected. The reason many cases are missed is that they escape microscopic examination and recognition.—B. C.

1817. *Panflavinpastillen zur Desinfektion von Mund- und Rachenhöhle. (Pastilles of Panflavin for the Disinfection of the Mouth and Throat.)* G. SPIESS. Deutsche med. Wchnschr. 1920, 46, 511-512.

In spite of the many difficulties in the way of actual complete sterilization of the mouth cavity, the automatic massage as well as continual production of a dilute disinfecting solution resulting from the sucking of suitable pastilles is greatly to be recommended as a prophylactic and perhaps as a cure for the usual mouth diseases.

The author recommends the incorporation of trypanflavin into pastilles to be used for the above purpose. The disinfectant is harmless to the patient, and quite unaffected in its bactericidal properties by the saliva.—B. C.

## SURGICAL BACTERIOLOGY

(See also Numbers 1789, 1853)

1818. *Wundsekretuntersuchungen im Kriege: Versuche der Serumbehandlung des Gasbrandes. (Studies on War Wounds; Serum Treatment in Gas Bacillus Infections.)* EUGEN JECKL. Wien. klin. Wchnschr., 1920, 33, 189-192.

Gas bacilli are found in wounds in greatest numbers after about 12 hours, and proper treatment in many cases may hinder this development. In more than four-fifths of the cases the predominating gas bacillus was of the *B. welchii* type. One-third of those examined showed pure infections, the rest being mixed with pyogenic cocci; but the fatality rate in both classes was about the same. Attempts in 57 grave cases to treat the gas infection with anti-serum resulted in failure, due apparently to ignorance of the proper technic in preparation and administration of this new serum.—B. C.

1819. *Zur Frage der Wunddiphtherie. (Wound Diphtheria.)* CLAUS HARMS. München. med. Wchnschr., 1920, 67, 513-514.

A report of 8 cases of wound diphtheria with absence of throat symptoms. The mode of infection is not clear.—B. C.

## SEROLOGY

(See also Numbers 1556, 1557, 1809)

1820. *Streptolysin.* P. H. DEKUIF AND P. M. IRELAND. J. Infect. Dis., Chicago, 1920, 26, 285-329.

The beta hemolytic streptococcus is shown to produce a hemolysin, which exists free in the culture fluid. The amount of free hemolysin present at different intervals of incubation was determined by the titration of the supernatant fluid of serum broth cultures centrifuged at 8,000 revolutions a minute for 3 minutes. Constant results were obtained in the many experiments reported.

Lysin production begins in cultures at about the fifth hour, reaches its maximum in 7 to 8 hours and disappears after the fourteenth hour. The lysin present in older cultures than this is demonstrable only when the bacterial emulsions are used in the titrations.

Sheep and horse serum are greatly superior to human serum and rabbit serum as enrichment material for cultures in which lysin is desired. Graphs are reproduced showing comparisons of these sera. Twenty per cent sheep or horse serum heated to 56°C. for 45 minutes is most advantageous.

On the basis of these observations a "synthetic" blood plate was devised, composed of 20 per cent heated sheep or horse serum, 5 per cent red cells, 75 per cent agar. Four parts of serum are first mixed with 1 part of red cells, and this mixture added to the usual 2 per cent agar at 42°C. Maximum lysin production occurs on this plate.—S. B-J.

1821. *Serological Studies on Tuberculosis. Third Contribution: Concerning Precipitins and Complement-Fixing Antibodies.* YOSHIO NISHIDA AND S. A. PETROFF. *Am. Rev. Tuberc.*, Balt., 1920, 4, 322-339.

A high titre serum was produced by injecting intravenously into a sheep, human tubercle bacilli heated at 60-65°C. for half an hour. Ten such injections gave a titre of 0.0001. The injection of bovine tubercle bacilli caused the titre to drop. At death, no tuberculosis could be demonstrated in the animal. A methyl alcohol extract of tubercle bacilli, dried and taken up in sodium chloride, when injected into a sheep gave a very low titre serum. Three injections of living human tubercle bacilli caused the titre to rise to 0.0025.

Studies were made on large amounts of serum drawn from these animals with the following results: Thirty minutes at 60°C. altered the antibodies not at all, but at 70°C. they were practically destroyed; the antibodies were not diffusible, showing them to be true colloids; X-ray radiation affected them not at all, nor did it destroy the antigen or complement; sunlight had slight effect on antibodies and antigen but considerable on complement; while ultraviolet rays destroyed the complement and antibodies but affected the antigen only slightly.

A study of the chemical nature of antibodies would indicate that they are not lipoids but are globulins or are carried down with globulin precipitation. The antibodies responsible for the precipitin test and complement fixation test are considered the same, but representing two distinct phases of the same phenomenon.—T. G. H.

1822. *Complement Fixation in the Diagnosis of Tuberculosis.* W. H. MOORSUND. *J. Infect. Dis.*, Chicago, 1920, 26, 85-92.

Complement fixation tests with the sera of 103 tuberculous patient sat Fort Sam Houston were carried out, using Petroff's antigen No. 2, which consists of the methyl alcohol extract of dried tubercle bacilli. The test was found to be non-specific, positive reactions taking place with the sera of patients with syphilis or gonorrhea. No diagnostic or prognostic conclusions of any value could be drawn from the results of the tests.—S. B-J.

1823. *The Serum Reaction in Gonorrhea and Syphilis. Results of Blood Tests on Different Classes of Individuals.* J. B. KELLY. *Northwest Med.*, Seattle, 1919, 18, 187-188.

Cholesterin human heart antigen and Warden's gonococcus antigen were used. Watery extracts of gonococcus were found unsatisfactory. The author found the complement-fixation test for gonococcus infection more reliable than smear examination, 70 per cent giving a positive reaction.—C. P. B.

1824. *Grouping of Bacillus influenzae by Specific Agglutination.* J. C. SMALL AND G. K. DICKSON. *J. Infect. Dis.*, Chicago, 1920, 26, 230-237.

Serological studies upon 10 strains of Gram-negative hemoglobinophilic bacilli, considered to be *B. influenzae* (Pfeiffer) were made by immunising rabbits to these strains. Agglutination and absorption tests carried out with the sera of these animals showed definite cross agglutinations among the various strains, the evidence opposing the view that all strains of *B. influenzae* are dissimilar. Four groups were demonstrated. Seventy per cent of all strains studied were included in two of these groups.—S. B-J.

1825. *Die Komplementbindungsreaktion bei der spanischen Grippe. (The Complement Fixation Reaction in Epidemic Influenza.)* ALEXANDER ENGEL. *Wien. klin. Wchnschr.*, 1920, 33, 493-494.

The sera of 60 per cent of epidemic influenza patients gave a positive complement fixation reaction with the specific antigen, mostly during the febrile stage of the disease. The reaction is usually positive in pneumonic complications. Of those giving a negative reaction, half were in the febrile stage, but none had pneumonia. The reaction usually becomes negative with the passing of the fever. Purulent and suppurative infections like the pneumonias and tuberculosis gave a positive reaction, but other acute febrile affections like typhoid, sepsis, pyemia, appendicitis and miliary tuberculosis did not give the reaction. Syphilitic sera with a 4 plus Wassermann reaction were positive. Simultaneously with this reaction, 10 per cent of influenzal sera showed a temporary positive Wassermann test. It is believed that this reaction is not due to the specific influenzal infection, but to the secondary invasion which is always present in influenza.—B. C.

1826. *The Action of Leukocytic Extracts on the Phagocytic Activity of Leukocytes.* R. TUNNICLIFF. J. Infect. Dis., Chicago, 1920, 26, 447-450.

Intraperitoneal and subcutaneous injections of extracts of horse or dog leucocytes produced a leucocytosis, the counts rising from 8000 in 30 minutes to 13,200 in 1 hour, and remaining high for about 4 days. Phagocytosis experiments were made with these leucocytes. During the height of the leucocytosis, the polymorphonuclear cells were eight times more actively phagocytic than normal.

Leucocytic extracts apparently exerted no influence upon the leucopenia of benzol poisoning.—S. B-J.

1827. *Ricerche sulla fagocitosi. (Researches on Phagocytosis.)* J. IRALA. Ann. d'ig., Roma, 1920, 30, 28-34.

The phagocytic power of human blood on bacteria under conditions that are comparable to those in which the body acquires great resistance to infections was studied. The technic used is given in detail. The results obtained were as follows:

(1) Ultra-violet rays at first favor the phagocytic power of leucocytes. On long exposure the phagocytes are altered and their power is diminished.

(2) Calcium chloride inhibits phagocytosis of living but favors it with regard to dead bacteria.

(3) Lactic acid in a concentration of 0.5 to 0.05 inhibits phagocytosis.—P. M.

1828. *Zur Kenntnis der Phagozytose und künstlich erzeugten therapeutischen Leukozytose. (Phagocytosis and Artificially Produced Leucocytosis.)* WALTER PFENNIGER. Arch. f. wissenschaft. u. prakt. Tierh., Berl., 1918, 44, 67-79.

The author used the technic of Neufeld, and concludes: That all substances which favor phagocytosis show positive chemotaxis, produce leucocytosis and hasten cell division. These substances must, consequently, have a favorable influence over regeneration and healing processes. The use of such substances is indicated in surgery. We can presume that there is a relation between the action of such bodies and hypertrophy as well as the development of blastoma. In this connection, we may refer to the experiment of Bernhard Fischer and others with azo dyes.—J. T.

1829. *Is There a Parallelism between Normal Agglutinins and Hemolysins or Human Blood?* REUBEN OTTENBERG AND FRANCES KRASNOW. Proc. N. York Path. Soc., 1919, 19, 83-87.

The authors investigated the question of whether the strength of the isohemolysin in human serum ran parallel to the strength of the iso-agglutinins, since some workers believe that human hemolysis only occurred in serum which had strong agglutinating power. Serums from 1 to 3 days old were grouped according to standard clinical methods. Preliminary tests for hemolysis were done by using:

- Group I sera with Groups II, III, and IV cells
- Group II sera with Groups III and IV cells
- Group III sera with Groups II and IV cells

All red sera were discarded; controls were made by using each serum with its own cells. If hemolysis occurred in the preliminary test, titration of the hemolysins was made against the several specimens of cells which it hemolyzed. These tests were made with serum undiluted, then in the following dilutions: 1:2; 1:4; 1:8; 1:16; 1:32; and in some cases, 1:64 and 1:128. In each test the amount of serum was twice the amount of 5 per cent cell emulsion. Reactions were read after 1 hour incubation in water bath at 37°C., and 18 hours in the ice box. All sera which showed hemolysis were titrated for agglutinins; if the hemolysins were strong the serum was inactivated before the agglutination titration was made. The results of the tests are tabulated. Out of 76 sera, 49 showed both agglutination and hemolysis. In all, 450 separate tests were necessary to cover various combinations of sera with cells of incompatible groups. Twenty-five sera possessed weak agglutinating power, but 11 of these showed strong hemolytic power while 14 showed weak hemolytic power. Twenty-four sera gave strong agglutination reactions, of these 20 showed strong hemolysis, while 4 showed weak hemolysis. The authors conclude their report with the following statement: "So far as can be judged from these observations, strong hemolysis accompanies strong agglutination more often than weak agglutination; and weak hemolysis parallels weak agglutination more often than it does strong agglutination. On the other hand it is not safe to conclude, because agglutination is weak, that hemolysis will not occur. Strong hemolysis often occurs with weak agglutination. In the practice of transfusion, therefore, donors should be rejected whose red cells would be agglutinated by the patient's serum, whether such agglutination be weak or strong. Any such case provides the possibility of extensive hemolysis occurring in the body."—L. W. F.

1830. *Ueber die Bewertung der Agglutinationsreaktionen bei Fleckfieber mit verschiedenen Mikroorganismen. (The Evaluation of Agglutination Reactions with Different Bacteria in Typhus Fever.)* E. WEIL. Deutsche med. Wchnschr., 1920, 46, 343-345.

The specificity of the Weil-Felix reaction is reiterated in reply to Rocha Lima's criticism. Thus far, the objections that have been raised are not valid.—B. C.

1831. *Der Einfluss des Nährbodens auf die Weil-Felixche Reaktion. (Influence of the Nutrient Medium on the Weil-Felix Reaction.)* W. MICHAELIS. Deutsche med. Wchnschr., 1920, 46, 619-620.

A culture of  $X_{19}$  grown on sugar-free agar is agglutinated by rabbit immune serum only in higher concentrations. The addition of glucose to the medium increases the agglutinability of the organism up to spontaneous clumping. There is no constant relation apparent between the conditions of growth and the agglutinability of the organism. The reaction performed in conductivity water plus sugar gave no rise in titer, but it was different in physiological saline to which glucose had been added. In the latter case there was an increase in titer and both living and dead organisms were alike affected.

The phenomenon is explained as being at least in part due to the production of acid by  $X_{19}$  from the sugar, which acid acts perhaps as a catalyzer in a combined immune- and acid-agglutination. Lactose, from which  $X_{19}$  does not produce acid, does not affect the agglutination titer.—B. C.

1832. *Erfahrungen mit der dritten Abänderung (D. M.) der Meinickeschen Ausflockungsprobe. (Experiments with the Third Modification (D. M.) of the Meinicke Precipitation Test.)* HANS SCHMIDT AND RUDOLPH POTT. Deutsche med. Wchnschr., 1920, 46, 519-520.

As a substitute for the complicated Wassermann reaction a number of precipitation reactions have been suggested, among them being that of Meinicke with its 3 modifications. In the third modification of the Meinicke test a comparative excess of NaCl to the extract plus serum mixture causes a precipitation in the positive cases. The test has been compared with others on 1333 sera and found to be extremely sensitive as well as favorably comparable in accuracy with the Wassermann reaction. The advantages of the test are the simplicity in technic, and its equal applicability to serum and spinal fluid. The serum for test need not be strictly fresh, nor perfectly colorless, but blood cells must be removed. Inactivation at 55° is necessary, but higher temperatures affect the sensitiveness of the test.—B. C.

1833. *A Study of the Behavior of Syphilitic and Normal Sera towards Certain Colloidal Solutions.* V. R. MASON. Johns Hopkins Hosp. Bull., Balt., 1920, 31, 234-236.

The author tested several colloidal solutions—1 per cent lichithin in alcohol, acetone insoluble antigen of Noguchi, 1 per cent lecithin plus 0.2 per cent cholesterin in alcohol, 1 per cent mastic alcohol, various concentrations of sodium oleate in water and alcoholic beef heart extract plus 0.2 per cent cholesterin—with 200 inactivated blood sera. Of these colloidal solutions only the last, diluted 1:6 with physiological salt solution, was satisfactory. With this solution the following results were obtained.

	NUMBER OF WASSERMANN REACTIONS	FLOCCULATION		
		Present	Absent	Doubtful
Positive.....	104	96	3	5
Suggestive positive.....	5	5	0	0
Doubtful.....	19	14	1	4
Suggestive negative.....	13	5	3	5
Negative.....	59	1	53	5

The author believes the physical difference between normal and syphilitic sera is possibly of great importance in the complement fixation reaction.—F. W. H.

1834. *Zur Serodiagnose der Lues mittelst neuerer Präzipitationsreaktionen. (The Serodiagnosis of Syphilis by Recent Precipitation Reactions.)* L. KIRSCHNER AND J. SEGALL. Wien. klin. Wchnschr., 1920, 33, 377-378.

In over 1000 comparative tests, there was about 80 per cent agreement between the Sachs-Georgi precipitation test and the Wassermann reaction. On the other hand, the third modification of the Meinicke precipitation test gave a 90 to 95 per cent agreement. The Meinicke modification is especially applicable in detecting latent syphilitic infection.—B. C.

1835. *Wassermannsche und Sachs-Georgi Reaktionen bei Syphilis. (Wassermann and Sachs-Georgi Reactions in Syphilis.)* TR. BAUMGÄRTEL. München. med. Wchnschr., 1920, 67, 421-423.

In the author's examination of 7000 sera there was about 90 per cent agreement between the S-G and Wassermann reactions. The S-G reaction should be performed in an incubator at 37°, and observed not only after 24 hours, but also after 2 and 48 hours. Serologically atypical syphilis may be detected by this procedure.—B. C.

1836. *Zur Methodik der serodiagnostischen Luesreaktion nach Sachs-Georgi.* (Procedure in the Sachs-Georgi Sero-reaction for Syphilis.) GERHARDT WODTKE. München. med. Wchnschr., 1920, 67, 419-421.

The sensitiveness of the Sachs-Georgi flocculation reaction may be increased more or less by the use of a double quantity of serum. Many sera give a stronger precipitate when used in the usual small amount, than when double the quantity is tested. The use of several different extracts is desirable. In addition to cholesterinized beef heart extract, cholesterinized human heart extract has been found to give a good flocculation test.—B. C.

1837. *Die Ergebnisse der Sachs-Georgischen Ausflockungsreaktion bei Blut- und Liquoruntersuchungen.* (Results with the Sachs-Georgi Flocculation Test upon Blood and Spinal Fluid.) W. SCHONFELD. München. med. Wchnschr., 1920, 67, 399-402.

In the examination of the blood serum of syphilitics, the Sachs-Georgi (S-G) reaction shows relatively close agreement with the Wassermann (W) test. Compared with each other, the S-G test is to be preferred to the W because of sharper readings. Both react non-specifically with sera from outspoken tuberculosis infection.

In spinal fluid examinations, a certain proportion of the cases showed spontaneous precipitation. After separation of the precipitate, the S-G test was applied and never gave a non-specific reaction.—B. C.

1838. *Einfluss der Temperatur auf die Sachs-Georgische Ausflockungsmethode bei Syphilis.* (Effect of Temperature on the Sachs-Georgi Flocculation Test for Syphilis.) L. HAUCK. München. med. Wchnschr., 1920, 67, 369-370.

The Sachs-Georgi reaction is very sensitive to temperature. In order to secure dependable results, it should be carried out in an incubator for 18 hours, when it gives results quite as accurate as the Wassermann reaction.—B. C.

1839. *Zur Luesdiagnostik mittels Wassermannscher Reaktion, Sternscher Modifikation und Ausflockungsmethode nach Sachs-Georgi.* (Diagnosis of Syphilis by the Wassermann Reaction, the Stern Modification and the Flocculation Method of Sachs-Georgi.) W. HINZELMANN. München. med. Wchnschr., 1920, 67, 402.

The Sachs-Georgi test is shown to be somewhat less sensitive than the Wassermann reaction, but it should be useful as an adjunct to the Wassermann, and because of its simplicity may well replace the Stern modification as a control.—B. C.

1840. *Ueber 'thermolabile' Ausflockung nach Sachs und Georgi.* ('Thermolabile' Flocculation according to Sachs and Georgi.) TR. BAUMGÄRTEL. München. med. Wchnschr., 1920, 67, 747-748.

All normal human blood sera when cooled for 24 hours at 0°C. give a globulin precipitate which redissolves at 37° in 2 hours. This 'thermolabile' flocculation also occurs sometimes when the Sachs-Georgi reaction is carried out. The flocculation occurring in the Sachs-Georgi reaction when it is positive for syphilis is considered a thermostable precipitate of the globulin.—B. C.

1841. *Studien über Nukleinwirkung. III.* (Studies on the Action of Nucleins. III.) PAUL HABETIN. Wien. klin. Wchnschr., 1920, 33, 168-169.

Serum from a man injected with sodium nucleinate shows the phenomenon of complement fixation with sodium nucleinate as antigen. This result was obtained in 16 out of 22 experiments.—B. C.

1842. *Ueber die Verwendung der Abderhaldenschen Dialysierverfahrens bei Nierentuberkulose.* (Application of the Abderhalden Test to Renal Tuberculosis.) FRITZ WAUSCHKUH. Deutsche med. Wchnschr., 1920, 46, 711-712.

This is an unsuccessful attempt to apply the Abderhalden technic in the detection of specific ferments of tuberculosis in the kidney. Acute or chronic nephritis could not be differentiated from renal tuberculosis by this method.—B. C.

1843. *Some Observations on the Discrepancies and Standardization of the Wassermann Test.* G. HOLLISTER. Northwest Med., Seattle, 1920, 19, 21-22.

The standard method of the Medical Dept., Central Laboratory A. E. F. was used. The discrepancies were mainly due to the antigens supplied, as shown by comparisons made over a period of several months.—C. P. B.

1844. *Variations in the Wassermann Reaction.* ERIC R. WILSON. J. Lab. & Clin. M., St. Louis, 1920, 5, 670-671.

All facts causing such variations should be considered before accepting as final a positive Wassermann reaction in cases with a negative history and symptoms.—F. W. H.

1845. *Untersuchungen über die Senkungsgeschwindigkeit der Blutkörperchen im Zitratblut bei Nerven- und Geisteskrankheiten.* (Studies on the Settling Power of Blood Cells in Neuroses and Psychoses.) F. PLAUT. München. med. Wchnschr., 1920, 67, 279-282.

In male patients, the majority of cases of paralysis, lues and arteriosclerosis are differentiated from the majority of psychopathy, melancholia, dementia precox and epilepsy

patients by an acceleration in the sedimentation rate of the red blood cells in citrated plasma. The acceleration is due to an agglutination of the erythrocytes. Differences in the degree of agglutination are dependent on the concentration of the salts present.

In females, the rate of sedimentation is normally more rapid than in males, but blood of syphilitic women shows this same acceleration. The results are, however, not so reliable because normal physiological phenomena, like menstruation, influence the settling in the same way. This phenomenon of accelerated sedimentation of the erythrocytes is considered a pathological sign, though no interpretation can yet be made of it.—B. C.

1846. *Studien über die Natur der Antikörper bei Malleus. (Studies on the Nature of the Antibodies in Glanders.)* W. BUROW. Arch. f. wissenschaft. u. prakt. Tierh., Berl., 1918, 44, Suppl., 464-473.

Burow studied the complement fixing bodies in glanders. He found that these bodies do not pass animal dialyzers and, therefore, must be colloidal in character. They do not belong to globulins precipitated by acetic acid, and are insoluble in ether. He further found that they are not albumins, but belong to the globulins precipitated by sodium sulphate and are water-soluble, they are not pseudoglobulin but are water-soluble euglobulins. The fixing bodies are destroyed by heating at 70°C. for 20 minutes. They are precipitated by alcohol, the precipitate being soluble in water and in 0.85 per cent salt solution. The best and most complete solution can be obtained when a trace of alkali is added to the saline solution, e.g., 2 drops of 1/100 normal NaOH solution.—J. T.

1847. *Ueber die Mastixreaktion (Emanuels) und ihre Stellung zu anderen Reaktionen in der Rückenmarksflüssigkeit. (The Emanuel Mastic Reaction and Its Relation to Other Reactions in the Spinal Fluid.)* W. SCHÖNFELD. München. med. Wchnschr., 1920, 67, 482-484. The mastic reaction is theoretically of interest, but as a diagnostic test for syphilis it does not represent an advance in the clinical examination of the spinal fluid.—B. C.

## SERUM THERAPY

(See also Numbers 1621, 1636, 1642, 1634, 1726, 1727, 1736, 1818, 1867, 1870)

1848. *Some Factors Influencing the Potency of Concentrated Antitoxic Serum.* C. R. HIXSON. J. Infect. Dis., Chicago, 1920, 26, 130-147.

The green color of antitoxic sera is found to be associated with the more soluble portions of the pseudoglobulin and is determined by the age of the plasma, by the method used in concentration, and by the presence of certain chemicals used as preservatives. Plasma preserved with tricesol yields a yellow product.

The percentage precipitation of protein from heated plasma containing 30 per cent ammonium sulphate increases as the temperature is raised to 70°C. As the temperature is increased during the process of concentration, the potency of the antitoxic products becomes greater. Heating above 60°C. for one-half hour is not commercially advisable, owing to an appreciable loss of antitoxin.

An interesting physical phase of antitoxic plasma is illustrated by data in this report, showing that with the increased elimination of protein as the temperature applied is increased there is a transfer of antitoxin from the protein rendered insoluble by heat and ammonium sulphate to the more soluble fraction of the plasma.—S. B-J.

1849. *The Influence of Normal Beef Serum on the Anthrax Bacillus.* J. A. KOLMER, D. C. WARNER AND M. E. KOEHLER. J. Infect. Dis., Chicago, 1920, 26, 148-159.

Investigators in Argentine and other countries have reported that normal beef serum is more efficient in the cure of patients infected with anthrax than specific horse anti-anthrax serum. This paper deals with a study of the protective and antibacterial qualities of beef serum. No cases of anthrax in man were studied and the observations are limited to serological tests and protection experiments with rabbits and mice.

Protection tests, consisting of the intraperitoneal injection of mice with heated and unheated normal beef serum in doses of 1 cc. to 10 cc. per 100 gm. failed to protect mice against 1 to 5 minimal lethal doses of the anthrax culture. The high degree of natural immunity of rabbits to anthrax renders them unsuitable for protection tests.

Unheated beef serum is bactericidal for the anthrax bacillus *in vitro*, contains variable amounts of agglutinin, but no complement fixing substances.

The authors conclude that "while normal beef serum contains some antianthrax substances, they are without demonstrable protective and curative value in experimental anthrax infections of mice and rabbits."—S. B-J.

1850. *Zur Frage der Avidität der Diphtherieantitoxine. (The Avidity of Diphtheria Antitoxins.)* RUDOLPH KRAUS. Deutsche med. Wchnschr., 1920, 46, 687-688.

Kraus questions the validity of estimating the curative power of diphtheria antitoxin by the *in vitro* method of Ehrlich, as used in the experiments of Kolle and his co-workers.

W. Kolle and H. Schlossberger in reply to the above criticism assert that the experience of numerous clinicians supports the results of their experiments in showing that therapeutic power runs parallel to antitoxin content as determined by the Ehrlich method.—B. C.

1851. *Utility of Antiplague Vaccines and Serums.* G. W. MCCOY AND C. W. CHAPIN. Pub. Health Rep., Wash., 1920, 35, 1647.

The use of plague vaccine as a prophylactic agent has been shown to be of a certain value on several occasions, but there is no evidence to show that an outbreak has been controlled by vaccination. Plague serum as a prophylactic agent is not to be considered seriously, as the immunity afforded is not complete and is of very short duration. The successful use of serum as a curative agent has been reported in only one outbreak, that in New Orleans in 1914.

The essential features of an antiplague campaign should therefore not be prophylaxis by the use of vaccines and serums or treatment of cases with serum but rather an avoidance of the infection by the extermination of rats and rodents.—I. A. B.

1852. *The Production and Experimental Use of Botulinus Antitoxin, Types A and B.* G. H. HART AND F. M. HAYES. J. Am. Vet. M. Ass., Wash., 1920, 57, 638-652.

The object of this work was to determine the therapeutic value of botulinus antitoxin in horses, cattle and chickens. Among others the following conclusions were drawn: (1) A fatal dose of botulinus toxin produces symptoms indistinguishable from natural outbreaks of forage poisoning. (2) Spontaneous recoveries from botulinus poisoning in chickens do occur even after symptoms are well developed. (3) Recoveries after the administration of antitoxin in field cases can not positively be credited to the therapeutic value of the material. (4) The field of usefulness of the antitoxin, therefore, will largely be confined to its prophylactic administration to animals on the same feed after one or more cases of the disease appears. The antitoxin has been used therapeutically on four human cases of the disease, all of which resulted fatally.—W. A. B.

1853. *Deux observations de septicémie gangreneuse et sérothérapie spécifique.* (Two Observations of Gangrenous Septicemia and Specific Serum Therapy.) M. LANGE. Bull. Soc. centr. méd. vét., Par., 1919, 95, 315-318.

Two case reports are given of gaseous gangrene following a wound in one case and acute founder in the other. A polyvalent serum based on pyogenic bacteria, the septic vibrio and *Bacillus perfringens* is used with success.—W. G.

1854. *Ueber gleichzeitige Behandlung gonorrhöischer Komplikationen mit Antigonokokkenserum und temperatursteigernden Mitteln.* (Simultaneous Treatment of Gonorrheal Complications with Antigonococcus Serum and Temperature-Raising Substances.) J. REENSTIERNA. München. med. Wchnschr., 1920, 67, 803-804.

Antigonococcus ram serum was prepared and to it was added some agent for causing a febrile reaction (usually killed typhoid bacilli). This material, when injected directly into the site of gonorrheal abscesses usually caused a quick cessation of pain and ultimate cure.—B. C.

1855. *Secondary Meningitis Treated by Intraspinous Administration of Autogenous Serum.—Report of a Case.* T. M. SANDERS. Am. J. M. Sc., Phila., 1920, 159, 246-257.

A fatal meningitis following bronchopneumonia sometimes occurred during the last influenza epidemic. As reported these meningitides were caused by pneumococci, various kinds of streptococci, and occasionally *B. influenzae*. The author suggests treating such cases by intraspinal administration of autogenous serum, presuming that similar organisms are responsible both in the bronchopneumonia and the meningitis. Where the blood cultures are negative and the pulmonary conditions are clearing, he assumes antibodies are formed against the offending organisms, and that these will act beneficially when the serum is given intraspinaly. A case of post-influenzal meningitis is reported in detail which was treated by this procedure with autogenous serum and followed by recovery. In conclusion he recommends "the use of autogenous serum injected into the subarachnoid space in cases of secondary meningitis when there is no efficient specific immune serum."—L. W. F.

1856. *The Technique of Whole Blood Transfusions and Its Value in Association with Surgical Procedures in the Treatment of Pernicious and Other Severe Anemias.* N. M. PERCY. Northwest Med., Seattle, 1920, 19, 87-94.

This paper is devoted chiefly to a description of the indications for transfusion.—C. P. B.

## ANAPHYLAXIS

(See also Number 1801)

1857. *Anaphylactoid Phenomena from the Intravenous Administration of Various Colloids, Arsenicals and Other Agents.* PAUL J. HANZLIK AND HOWARD T. KARSNER. J. Pharmacol. & Exper. Therap., 1919, 14, 379-423.

Thirty-one agents were studied; of these ether anaesthesia and intravenous injection of normal saline were harmless; intravenous injection of agar sol 0.5 per cent, agar gel 0.5 per cent, agar sol-gel (1:4 and 1:6), dog's bile, human serum and typhobacterin resulted in anaphylactoid symptoms, pulmonary congestion and distension, hemorrhage and thrombi



without cardiac dilatation; intravenous injection of althea extract, arsphenamine, neoarsphenamine, collargol, congo red, dextrin, gelatin, inulin, phylacogen, rabbit's serum, sodium arsenate and venarsen affected principally the circulatory system causing pulmonary congestion and hemorrhages and respiratory distress; intravenous injection of acacia, plain, dialysed and toxified with rabbit's serum, beef serum, glycogen, nuclein solution, pancreatin, peptone, pollen extracts, and starch caused anaphylactoid symptoms, pulmonary distension, congestion and hemorrhage and cardiac dilatation.

The authors' results show that the intravenous administration of drugs, particularly of new remedies or those of doubtful use, should not be indulged in promiscuously.

The authors believe it is incorrect to regard the disturbances following intravenous injection of sundry agents as true anaphylaxis or as bearing any causal relationship to it.—F. W. H.

1858. *A Comparison of the Prophylactic Effects of Atropine and Epinephrine in Anaphylactic Shock and Anaphylactoid Phenomena from Various Colloids and Arsphenamine.* PAUL J. HANZLIK AND HOWARD T. KARSNER. *J. Pharmacol. & Exper. Therap.*, 1920, 14, 425-447.

Intravenous inoculation of atropine in guinea pigs in quantities of 0.01 mgm. per gram of body weight protects completely against the toxic effects produced by intravenous injection of beef serum and of peptone in doses similar to those used in the proteose therapy of Nolf. It affords partial protection against the effects of agar sol, agar sol-gel, arsphenamine, congo red, larger doses of peptone, serum sensitization and typhobacterin. It gives no protection against acacia, althea, dextrine, pollen extract and starch.

Epinephrine in a dose of 0.0005 cc. of 1:10,000 per gram of body weight when injected intravenously with the antigen or immediately before it protects the guinea pig against death from anaphylactic shock. It also partially protects against the effects of arsphenamine but fails to protect against those of agar sol-gel, dextrine, peptone and starch.

From the results obtained with atropine and epinephrine the authors argue that the mechanism of the action of agar and similar substances bears no relationship to anaphylaxis or anaphylactic shock.—F. W. H.

1859. *Effects of Various Colloids and Other Agents Which Produce Anaphylactoid Phenomena on Bronchi of Perfused Lungs.* PAUL J. HANZLIK AND HOWARD T. KARSNER. *J. Pharmacol. & Exper. Therap.*, Balt., 1920, 14, 449-461.

The authors draw the following conclusions:

"1. Perfusion of the lungs of guinea-pigs with agar sol gel (1:6) causes prompt and marked distension of the lungs and stoppage of the perfusion flow due to the massing of agar emboli in the pulmonary vessels.

"2. Prompt distension of perfused lungs occurs with peptone and histamine but in the absence of pulmonary emboli, and this is due to active stimulation of bronchial muscle.

"3. The distension from agar is not due to direct stimulation of bronchial musculature or parasympathetic endings, since the effects are not antagonized by papaverine and atropine.

"4. The mechanism of agar action consists of a passive broncho-constriction by compression of bronchioles from emboli in the pulmonary vessels.

"5. Passive broncho-constriction is also the chief mechanism in the pulmonary inflation produced by agar in intact guinea-pigs whose pulmonary vessels contain thrombi invariably although, of course, a superimposed bronchial stimulation from central stimulation occurring as a result of the supervening asphyxia is conceivable as a secondary phenomenon.

"6. The following agents produce no gross distension of perfused lungs, therefore no peripheral broncho-constriction: acacia, althea, arsphenamine, congo red, dextrose, gelatin, glycogen, nuclein solution and soluble starch. Whatever inflation these agents produce (though variable) in intact animals, appears to be of central origin due to asphyxia arising from circulatory injury, which exists. When the inflation is absent the effects are entirely circulatory (arsphenamine)."—F. W. H.

1860. *Effects of Various Colloids and Other Agents Which Produce Anaphylactoid Phenomena on Surviving Intestine and Uterus.* PAUL J. HANZLIK. *J. Pharmacol. & Exper. Therap.*, Balt., 1920, 14, 463-478.

The author reports the following results:

"1. The direct application of agar sol and agar gel to surviving intestine and uterus produces either no effect or slight depression of peristalsis.

"2. The following agents in high and low concentrations uniformly depressed the peristalsis of surviving intestine and uterus; acacia, dextrin, glycogen, gelatin, starch, human and horse serums and nuclein solution. Althea extract was somewhat variable, although depression was most common, irrespective of the chemical reaction.

"3. The following agents as controls produced moderate to marked stimulation of intestinal and uterine peristalsis: peptone and rabbit's serum. Beef serum was irregular. Definite and rather marked stimulation was produced by congo red in low concentrations. This does not agree with the results obtained on the bronchi of perfused lungs.

"4. These effects on intestinal and uterine musculature agree with those on bronchial musculature (except congo red) previously reported.

"5. The results of this study sustain the contention elaborated in previous papers as to the bronchial musculature that the disturbances produced by the intravenous injection of agar and various non-protein colloids, and also arsphenamine, bear no relationship whatsoever to anaphylaxis or anaphylactic shock."—F. W. H.

1861. *Hemagglutination in Vitro by Agents Which Produce Anaphylactoid Symptoms.* H. T. KARSNER AND P. J. HANZLIK. *J. Pharmacol. & Exper. Therap.*, Balt., 1920, 14, 479-492.

The following are the authors' results:

"1. The following agents and their approximate lowest effective end concentrations cause agglutination of human, cat and guinea-pig red blood corpuscles *in vitro*: acacia (1 per cent); althea (0.08 per cent), agar (0.001 per cent), arsphenamine (< 0.04 per cent), atropin sulphate (0.002 per cent), beef serum, collargol (< 0.005 per cent), gelatin (0.05 per cent), neoarsphenamine (0.025 per cent) nuclein solution, starch (0.5 per cent) thromboplastin (Squibb, 2.8 per cent) and tragacanth.

"2. No demonstrable agglutination was produced by the following: coagulen (0.5 per cent), congo red (0.34 per cent), dextrin (1 per cent), epinephrin (0.000083 per cent), glycogen (0.1 per cent), kephalin (0.05 per cent), peptone (Witte, 1 per cent), pollen extracts (6 per cent), serums of dog, horse, man and rabbit (11 per cent), sodium arsenate (0.05 per cent), venarsen (0.26 per cent), and normal saline (0.9 per cent NaCl).

"3. Hemolysis though variable was produced by acacia, arsphenamine, coagulen, collargol, gelatin, kephalin, nuclein solution, dog serum and thromboplastin (Squibb and Armour), and blood discoloration (methemoglobin and hematin formation, etc.) by althea, arsphenamine, gelatin, neoarsphenamine, peptone, starch and tricrosol.

"4. Agglutination *in vitro* is a common phenomenon among agents which produce anaphylactoid symptoms.

"5. Hemagglutination *in vitro* and thrombus formation are closely correlated in certain instances, but this relation is by no means constant or necessary.

"6. Those agents which cause hemolysis *in vitro* are frequently followed by pulmonary hemorrhage after injection in guinea-pigs. On the other hand, hemorrhage frequently occurred with many agents that did not cause hemolysis under the conditions."—F. W. H.

1862. *Anaphylaxis and Allied Phenomena in Relation to Disease.* T. HARRIS BOUGHTON. *J. Lab. & Clin. M.*, St. Louis, 1920, 5, 597-608.

This article is a general review of the subject, treating of the theories advanced to explain anaphylaxis, of passive anaphylaxis, antianaphylaxis, bacterial anaphylaxis, the related phenomena and clinical considerations.—F. W. H.

1863. *Bestimmung der Herkunft von in Alkohol konservierten Organen mit Hilfe der Anaphylaxiereaktion.* (The Determination of the Origin of Alcohol Preserved Tissues by the Aid of the Anaphylactic Reaction.) RUDOLPH KLABE. *Arch. f. wissensch. u. prakt. Tierh.*, Berl., 1918, 44, 241-252.

Klabe sensitized 2 guinea pigs with human prostate preserved 11 years in alcohol; 4 guinea pigs with human muscle preserved 25 years in alcohol; 3 guinea pigs with human muscle preserved 38 years in alcohol; 5 guinea pigs with human muscle preserved 41 years in alcohol. All these showed anaphylactic reaction when injected with inactivated human serum. One of the fourth group was injected with horse serum and did not show any reaction.

Two guinea pigs were sensitized with bovine muscle preserved in alcohol 50 to 60 years. One of these, when later injected with bovine serum, showed anaphylaxis. The other, injected with horse serum, showed no reaction.

Two other guinea pigs were sensitized with equine muscle preserved in alcohol 50 to 60 years. One of the latter, injected with horse serum, showed anaphylaxis, while the second one, injected with bovine serum, failed to react.

Non-sensitized guinea pigs in these experiments used as controls failed to react when injected with the various sera.

The organs before inoculation were cut into small pieces, washed in running water, dried, ground and inoculated in physiologic saline.—J. T.

1864. *Some Remarks on the Leucocytes in Anaphylaxis of Serum Sickness.* JACOB ROSENBLOOM. *J. Lab. & Clin. M.*, St. Louis, 1920, 5, 671.

The authors state that acute anaphylactic shock and ordinary serum sickness show a leucopenia with a reduction of the polynuclear cells and no eosinophilia but in nonacute sensitization eosinophilia is observed.—F. W. H.

1865. *Uebererregbarkeit des vegetativen Nervensystems im Frühjahr und Ekzematod.* (Hypersensitiveness of the Vegetative Nervous System in the Spring and Fatal Eczema.) E. MORO. *München. med. Wchnschr.*, 1920, 67, 657-659.

The author notes that 14 cases of fatal constitutional eczema in infants under 2 years of age all occurred during the months of February, March and April, death being due to evidently vagal disturbance. This fact is believed to indicate that during the spring there is present a hypersensitiveness of the nervous system.—B. C.

1866. *Zur Kollargoltherapie des chronischen Gelenkrheumatismus mit besonderer Berücksichtigung der Kollargolanaphylaxie. (Collargol Therapy in Chronic Articular Rheumatism, with Special Reference to Collargol-Anaphylaxis.)* A. BÖTTNER. München. med. Wchnschr., 1920, 67, 341-343.

Intravenous injection of collargol calls forth both active and passive anaphylaxis, and reinjections during the anaphylactic period result in stronger focal reactions. This phenomenon is made use of in the treatment of chronic articular rheumatism. The mode of treatment is not universal, but depends upon the reaction of the patient to the first injection, and upon the presence of other pathological processes.—B. C.

1867. *Serum Sickness and Sudden Death Following the Hypodermic Administration of Antitoxin.* WILLIAM W. ROOT. N. York State J. M., N. Y., 1920, 20, 264-267.

After a brief summary of the literature and a short discussion of the prevention and therapeutics of serum sickness the author discusses sudden death following the administration of serum. He sums this up as follows:

"The death may have been caused by the serum but it does not accord with any known action of serum.

"The death may have been caused by the condition known as 'status lymphaticus' or some allied condition.

"It may have been from causes unknown.

"As the facts in hand are not sufficient to exclude definitely any one of these three possibilities, they should all be carefully considered before reaching a conclusion."—F. W. H.

1868. *Zur Serumkrankheit. (Serum Disease.)* H. WISSER. München. med. Wchnschr., 1920, 67, 668.

On the second day of a mild attack of diphtheria, the author injected into himself 3000 units of antitoxin. Seven days later a very severe attack of serum sickness resulted.—B. C.

## VACCINE THERAPY

(See also Numbers 1593, 1662, 1669, 1851, 1896)

1869. *Les vaccinations antirabiques a l'Institut Pasteur en 1919. (Vaccinations against Rabies at the Pasteur Institute in 1919.)* J. VIALA. Ann. de l'Inst. Pasteur, Par., 1920, 34, 412-415.

During the year 1919, 1,815 persons received antirabic treatment at the Pasteur Institute in Paris. Of these, 5 died of rabies, showing a mortality of 0.27 per 100. One of these patients died during the course of vaccination, and another died of rabies 15 days after the end of the treatment. These cases are deducted from the total, giving the corrected mortality from rabies after the Pasteur treatment as 0.16 per cent. The mortality statistics for this treatment by years since 1886 are reproduced in a table.—S. B-J.

1870. *Experimental Streptococcus Empyema. Attempts at Prevention and Therapy by Means of Vaccines and Serum.* F. P. GAY AND R. L. STONE. J. Infect. Dis., Chicago, 1920, 26, 265-284.

Empyema was produced in rabbits by injections of 0.1 to 0.2 cc. of broth cultures of a hemolytic streptococcus into the pleural cavity. Nearly all of a number of experiments were carried on with one strain of *Streptococcus pyogenes* and the immunological studies were therefore made with homologous sera and vaccines.

The experimental infection of the pleural cavity could be prevented by previous immunization of the animal with killed and living cultures of the same strain of streptococcus. The dosage of the vaccine was usually 9 or more injections, containing a total of about 6 to 10 billion streptococci.

The serum of rabbits immunized against intrapleural infection with the streptococcus was found to contain agglutinins, opsonins and precipitins. The technic of making these determinations, with detailed counts of bacteria in cultures are described. In some cases, the injection of this antistreptococcus serum simultaneously with the culture into the pleural cavity prevented the evolution of the otherwise invariable and fatal empyema. Cure of empyema by injections of the serum was obtained in a few animals. Vaccine therapy of localized empyema was ineffectual.—S. B-J.

1871. *Active Immunization Against Diphtheria.* J. B. SIDBURY. South. M. J., Birmingham, 1920, 13, 474-480.

A report of the use of the Schick test and immunization with toxin-antitoxin mixture on school children. He reports two cases in which diphtheria developed within one year following active immunization.—J. H. B.

1872. *Sensitized and Non-Sensitized Vaccines in Cholera Immunization.* M. TAKENOCHI. J. Infect. Dis., Chicago, 1920, 26, 441-446.

Cholera vibrios treated with anticholera serum, producing the so-called sensitized vaccine, were about one-eighth as toxic for guinea pigs as the non-sensitized vaccine. Guinea pigs and rabbits were injected with these two sorts of vaccine and tested at various intervals to deter-

mine the degree of consequent immunity. A test infective dose of twice the lethal dose of cholera bacilli was found to be most satisfactory for this sort of titration of immunity. The intervals after vaccination were from 3 hours to 9 days. The experiments showed that the non-sensitized vaccine was markedly superior to sensitized vaccine in stimulating an animal to form bacteriolysins and protective antibodies.—S. B-J.

1873. *Ueber chronische Bazillenruhr und ihre erfolgreiche spezifische Behandlung.* (*Chronic Bacillary Dysentery and its Successful Specific Treatment.*) ROGER KORBSCHE AND ARTHUR GROSS. Deutsche med. Wchnschr., 1920, 46, 735-736.

Chronic bacillary dysentery of the ulcerating colitis type was successfully treated by intravenous vaccination with autogenous vaccine.—B. C.

1874. *Ausgedehnte Zwangsschutzimpfungen der Zivilbevölkerung im Besetzten Gebiet gegen Typhus.* (*General Compulsory Protective Inoculations against Typhoid of the Civil Population in Occupied Territory.*) JOSEF BASTEN. Deutsche med. Wchnschr., 1920, 46, 316-318.

Two injections, 10 days apart, of British vaccine (typhoid and paratyphoid A and B) were given to 14,343 persons between the ages of 18 and 45, in a community where typhoid was epidemic. It is concluded that the vaccination did not damage the health nor did it affect unfavorably the course of other chronic diseases in the cases observed. Triple vaccine produced no stronger reaction than the single typhoid vaccine. The vaccination provoked the onset of typhoid in numerous cases which were in the incubation stage and thus tended to clear up the epidemic. There was, however, no evidence of a favorable effect on the typhoid morbidity. The vaccination improved the course of the disease.—B. C.

1875. *Inoculation Against Hayfever: An Experience, a Warning and a Suggestion.* WILL WALTER. J. Am. M. Ass., Chicago, 1920, 75, 670.

The author cites a case in which a previously harmless dose produced anaphylaxis when added to the local pollen absorption. No more large doses were given after this experience at season and all pre-season inoculation with ragweed pollen protein is withheld. Anaphylactic poisoning is best met by increasing the alkalinity of the blood and by administration of minute doses of homologous protein. An alkaline dietary and regimen was adopted and the frequent use of fractional doses of pollen protein were administered hypodermically in all cases and at all seasons.—P. G. H.

1876. *Ueber Erfahrungen mit 'Staphar' (Mast-Staphylokokken-Einheitsvakzine nach Prof. Strubell) auf Staphylokokkeninfektionen.* (*Results with 'Staphar' Vaccine on Staphylococcus Infections.*) GEORG KREBS. Deutsche med. Wchnschr., 1920, 46, 486-487.

This is a report of successful results obtained in treating 28 cases of acne, carbuncle, furuncle, venereal bubo, axillary abscess and trichophytosis with Strubell's vaccine (Deutsche med. Wchnschr., 1919, 45, No. 38). This agent has proven very effective when injected subcutaneously in quantities of 0.5 to 1 cc.—B. C.

1877. *The Production of Nonspecific Bactericidal Substances by Means of Staphylococcus and Streptococcus Vaccines in Vivo and in Vitro.* R. OTTENBERG AND K. WALLACH. Proc. N. York Path. Soc., 1919, 19, 55-60.

The authors repeated work previously published by Sir Almroth Wright who made the claim that "the mixture of staphylococcus or streptococcus vaccines with blood either *in vivo* or *in vitro* resulted in the elaboration in all likelihood from the leucocytes, of non-specific bactericidal substances which acted on either one of these organisms."

Tests were carried out in so far as possible by the method published by Wright, although certain details such as the preparation of the vaccines were omitted in the published report of that investigator. Only the *in vitro* tests were performed by the authors. Their results were negative, on several occasions even opposite to those reported by Wright, as "the normal bactericidal property of the serum was impaired instead of increased by the mixture of vaccine." It is stated "that some peculiarity in the mode of preparation of the vaccine may be essential" which might possibly explain the negative results of their tests.—L. W. F.

1878. *Experiments on Immunization with Pseudoblackleg Pellets.* T. P. HASLAM AND O. M. FRANKLIN. J. Infect. Dis., Chicago, 1920, 26, 424-426.

Separate groups of calves were vaccinated simultaneously with commercial blackleg pellets and with blackleg virus prepared in the laboratory of the Kansas State Agricultural College. After a period of about 3 weeks, the immunity of these calves was tested by giving them an injection of blackleg virus which was fatal to 50 per cent of nonvaccinated calves. The animals vaccinated with pseudoblackleg commercial pellets, containing probably *B. oedematis-maligni*, died of blackleg, while those vaccinated with true blackleg laboratory pellets (*B. chauvei*) were immune to a 1 gram test dose of blackleg virus. These commercial blackleg vaccines were, therefore, shown to be ineffectual.—S. B-J.

1879. *Vaccination anticlavaleuse par virus sensibilisé dans les Bouches-du-Rhône.* (*Vaccination against Sheep Pox with Sensitized Virus in Bouches-du-Rhône.*) E. CANABY. Bull. Soc. centr. méd. vét., Par., 1919, 95, 243-248.

The value of sensitized vaccine virus is demonstrated by extensive use in the field.—W. G.

1880. *Zur Frage der Fleckfiebereschuttsimpfung. (Protective Inoculation in Typhus Fever.)* B. MÖLLERS AND GEORG WOLFF. Deutsche med. Wchnschr., 1920, 46, 484-486.

Effective immunity is not produced by the injection into guinea pigs of killed typhus virus, thus confirming the results found in man. The necessary condition for a durable active immunity against typhus in man is the specific infectious process. Experiments on combined injections of living typhus virus and immune serum, or of the virus weakened in some other way, are suggested as offering some likelihood of success.—B. C.

1881. *Bericht über im Jahre 1917 gemachten Erfahrungen über Partigenbehandlung. (The 1917 Experience with Partial Antigen Treatment.)* RAHEL PILPEL. Wien. klin. Wchnschr., 1920, 33, 402-404.

The partial antigens for tuberculosis were prepared according to the method of Deycke and Much, and injected into tuberculous children. The immunity was increased generally and the result was satisfactory, but no better than that secured by other usual means of treatment.—B. C.

1882. *Erfahrungen über die Behandlung der Tuberkulose mit Partialantigenen, Deycke-Much. (Results from the Treatment of Tuberculosis with the Deycke-Much Partial Antigens.)* L. JACOB AND M. BLECHSCHMIDT. München. med. Wchnschr., 1920, 67, 447-449.

Results from 156 cases indicate that the treatment of tuberculosis in the second and third stages with the Deycke-Much partial antigens is a failure. In mild cases, it yielded good results, was harmless, and proved a satisfactory adjunct to the usual course of treatment. However, the results here were no better than those obtained by treatment with the ordinary Koch tuberculins.—B. C.

1883. *Kaltblütertuberkelbazillen als Schutz- und Heilmittel der menschlichen Tuberkulose. (Tubercle bacilli of Cold-blooded Animals as a Protective and Curative Agent in Human Tuberculosis.)* FELIX KLOPSTOCK. Deutsche med. Wchnschr., 1920, 46, 260-262.

A critical review of the experimental and clinical literature on the efficacy of vaccination with avirulent tubercle bacilli as a prophylactic and therapeutic measure. It is concluded as quite probable that such vaccination in infants and children does confer a temporary protection against tuberculosis, but its application to the pulmonary tuberculosis of adults has not been attended by success.—B. C.

1884. *Unsere Beobachtungen mit den Friedmann Tuberkuloseheilmittel. (Observations on the Friedmann Tuberculosis Vaccine.)* JOHANNES WEICKSEL. Deutsche med. Wchnschr., 1920, 46, 287-289.

Conflicting results from animal experiments indicate a doubt as to the complete harmlessness of the treatment upon man or animal. The duration of the immunity conferred on children is yet to be determined.—B. C.

1885. *Erfahrungen mit den Friedmannschen Tuberkuloseheilmittel. (Results with the Friedmann Tubercle Vaccine.)* M. JUNGMAN. Deutsche med. Wchnschr., 1920, 46, 393-394.

A report of 10 cases of pulmonary tuberculosis recently relieved by subcutaneous injections of the Friedmann vaccine.—B. C.

1886. *Ergebnisse mit dem Friedmannschen Mittel bei Lungentuberkulose. (Results with the Friedmann Vaccine in Pulmonary Tuberculosis.)* I. ZADEK. Deutsche med. Wchnschr., 1920, 46, 453-455.

A report on 36 cases treated by the Friedmann method (subcutaneous injection of avirulent tubercle bacilli). In spite of the fact that many of the cases were attended very early in the course of the disease, there was no decided curative effect noticeable following the treatment.—B. C.

1887. *Die antigene Wirkung der Friedmann-Bazillen. (The Antigenic Effect of the Friedmann Bacilli.)* H. SELTER. Deutsche med. Wchnschr., 1920, 46, 650-653.

As a result of a series of animal experiments it would seem that the non-virulent tubercle bacilli used by Friedmann in the cure carrying his name are ordinary tubercle bacilli of cold-blooded animals, and that they merely act like acid-fast saprophytes toward man and other mammals. If they produce any effect in the human body, such an effect can only be that due to the non-specific activity of any acid-fast bacteria. Consequently, the Friedmann treatment falls into the class of non-specific vaccine therapy. It follows therefore that there should be no difference whether the Friedmann bacilli or other acid-fast bacteria are employed in the treatment.—B. C.

1888. *Erfahrungen mit dem Friedmannschen Tuberkulosemittel bei Lungentuberkulose. (Experience with the Friedmann Treatment in Pulmonary Tuberculosis.)* A. BACMEISTER. Deutsche med. Wchnschr., 1920, 46, 653-654.

Though the Friedmann treatment is no doubt specific in initiating focal reactions, no lasting curative effect has been observed in the cases of pulmonary tuberculosis treated by the author. "It may safely be asserted that the treatment does not produce a continued heightened immunity against tuberculosis."—B. C.

1889. *Die Behandlung der Tuberkulose mit lebender, avirulenter Vakzine in steigender Dosis.* (Treatment of Tuberculosis with Live, Avirulent Vaccines in Increasing Doses.) FELIX KLOPSTOCK. Deutsche med. Wchnschr., 1920, 46, 764-765.

The attempt to combat human tuberculosis with injections of virulent bacilli is dangerous and not justified until it is shown that the application of avirulent organisms is useless. The author recommends the subcutaneous injection of successively increasing doses of living avirulent tubercle bacilli for building up an immunity against the disease. The degree of reaction of the patient should determine the amount to be injected. Of 25 cases of pulmonary tuberculosis thus treated, 22 showed more or less decided improvement.—B. C.

1890. *Die antigene Wirkung der Friedmann-Bazillen.* (The Antigenic Action of the Friedmann Bacilli.) F. LÜST. Deutsche med. Wchnschr., 1920, 46, 829-830.

The reaction produced in the body is that of a non-specific acid-fast saprophyte. Direct antigenic relation to the tubercle bacillus is slight.—B. C.

1891. *Ueber die Behandlung der chirurgischen Tuberkulose mit Kaltblüter-Tuberkelbazillen.* (Treatment of Non-pulmonary Tuberculosis with Tubercle Bacilli of Cold-Blooded Animals.) BRANDENSTEIN. München. med. Wchnschr., 1920, 67, 786.

Vaccination with living avirulent tubercle bacilli acts in favorable cases as an effective specific against tuberculosis and scrofula, especially when treated in their early stages. In advanced cases it tends to retard the toxic processes.—B. C.

1892. *Das Friedmannsche Heilmittel für Tuberkulose.* (The Friedmann Remedy for Tuberculosis.) M. WEISS. Wien. klin. Wchnschr., 1920, 33, 307-310.

Treatment with the Friedmann vaccine is an active immunization calling forth certain immunity reserves. It is, however, not a universal cure for tuberculosis. The vaccine is harmless and should serve as a valuable adjunct in tuberculosis therapy.—B. C.

#### NONSPECIFIC THERAPY

1893. *Ueber die unabgestimmte Immunität.* (Non-specific Immunity.) HANS MUCH. Deutsche med. Wchnschr., 1920, 46, 483-484.

Disease is only one stage in the effort of the body through the development of specific immunity to maintain its well-being. Such an active defense, however, keeps going on during apparent health even to a much greater degree perhaps than during disease. There are many disease conditions that are mainly overcome by non-specific forces, though specific substances are also demonstrable. Non-specific immunity may be produced by the most heterogeneous substances which stimulate the defense mechanism of the body to eliminate them, and simultaneously act upon the disease virus. Numerous examples occurring in common practice are cited.—B. C.

1894. *Weiteres zur unabgestimmten Immunität.* (Further Remarks on Non-Specific Immunity.) HANS MUCH. Deutsche med. Wchnschr., 1920, 46, 791.

Non-specific immunity may be measured when the laws governing its activity are better known. For the production of this type of immunity, the author has prepared a vaccine consisting of 3 reactive constituents: (1) protein, from the metabolism of non-pathogenic bacteria; (2) lipid mixture, from bile; (3) mixture of neutral fats from animal sources. The field of effectiveness of a high non-specific immunity is considered to be mainly in the rapid, highly febrile (acute) diseases; and that of specific immunity in the slow (chronic) diseases. In subacute diseases, both types should be effective. The small group of toxin diseases is not spoken of here.—B. C.

1895. *Zur Kenntnis der parenteralen Proteinkörpertherapie.* (Concerning Parenteral Protein Therapy.) GRAWERT. Berl. tierärztl. Wchnschr., 1920, 36, 209-211.

The author gives a record of 6 cases of phlegmons, one botryomycosis, one chronic acne, and two fistulas, successfully treated with aolan, prepared from cow's milk by removing the toxins and fat.—J. T.

#### EXPERIMENTAL INFECTION

(See also Numbers 1723, 1723, 1766, 1870, 1908)

1896. *Infection et vaccination par voie trachéale.* (Infection and Vaccination by the Tracheal Route.) A. BESREDKA. Ann. de l'Inst. Pasteur, Par., 1920, 34, 361-369.

The pulmonary epithelium readily allows the passage of soluble substances, but retains for some time insoluble particles. This barrier of the pulmonary epithelium is one factor in the natural defence of animals. Rabbits which succumb to the intravenous injection of 0.1 of a culture of *B. paratyphosus* B tolerate 10 times this amount when it is injected intratracheally. When, however, the respiratory tract is injured or sensitized by the intratracheal injection of 0.5 cc. of a 1:20 solution of ox bile, the animal is deprived of this means of defense and becomes as susceptible to infection through the lungs as through the veins.

Experiments with diphtheria and tubercle bacilli show that it is possible to produce a local immunity of the respiratory tract. Toxin and tuberculin are so rapidly absorbed through the pulmonary epithelium that no increased protective power of this tissue is induced. On the other hand, bacteria, which are retained in the pulmonary filter, apparently lead to a local immunity of the epithelium of the lungs. Animals which received intratracheal injections of killed diphtheria bacilli remained susceptible in the usual degree to this organism when injected intravenously, but resisted and survived large multiples of the fatal dose when the live bacteria were injected intratracheally.—S. B-J.

1897. *The Fate of Bacteria Introduced into the Upper Air Passages. V. Friedländer Bacilli.* ARTHUR L. BLOOMFIELD. Johns Hopkins Hosp. Bull., Balt., 1920, 31, 203-206.

After a brief discussion of the Friedländer group of bacilli and their incidence in disease and in healthy people the author reports experiments in which Friedländer bacilli were implanted on the tongue, nasal mucosa and in the tonsillar crypts; in all instances the organisms disappeared rapidly, as a rule in less than 24 hours, their removal being due to the mechanical flushing action of the secretions. It is the author's opinion that when these organisms are associated with disease it is almost invariably in the capacity of secondary invaders.—F. W. H.

1898. *Experimental Pneumococcus Meningitis in Rabbits and Dogs.* G. IDZUMI. J. Infect. Dis., Chicago, 1920, 26, 373-387.

Experiments showed that pneumococcus cerebrospinal meningitis may be produced with regularity in rabbits by injecting virulent cultures directly into the subarachnoid space of the spinal cord. The dosage usually employed to obtain this result was 1 cc. of a salt solution suspension of virulent pneumococci secured by centrifuging 5 cc. of a 24-hour broth culture and resuspending the cocci in 5 cc. of salt solution. Purulent leptomeningitis developed if the animal survived 48 hours after the injection.

Meningitis could not be produced in rabbits and dogs by intravenous injections of pneumococci, and the intrathecal injections in dogs were not reliable.

These studies show that the rabbit is a suitable animal for chemotherapeutic studies of the treatment of meningeal disease caused by pneumococci.—S. B-J.

1899. *Rekurrenzinfektionen bei Psychosen und experimentelle Untersuchungen über Rekurrenzspirochäten. (Recurrent Infections in Psychoses and Experiments on the Spirochetes of Relapsing Fever.)* R. WEICHBRÖDT. Deutsche med. Wchnschr., 1920, 46, 678.

Observations upon febrile temperatures such as occur in malaria, acting therapeutically upon neuro-syphilitics are here reported. A superimposed malarial infection was unsatisfactory for the purpose because it affected the patient too seriously in other ways. Infection with relapsing fever is much better suited for the purpose. This so-called 'fever therapy' has thus far yielded rather satisfactory results.

The patient was injected with 0.1 to 0.2 cc. of blood from a severely infected mouse and fever arose within 5 days. The blood Wassermann reaction was favorably improved after the relapsing fever infection had run its course.—B. C.

1900. *Die Depressionsimmunität. (Depression Immunity.)* J. MORGENROTH, H. BIBERSTEIN AND R. SCHNITZER. Deutsche med. Wchnschr., 1920, 46, 337-340.

Mice with an experimental chronic streptococcemia show a relative immunity to further infection with streptococci of the same or another variety. This intercurrent infection with an otherwise acutely fatal dose is tolerated without apparent damage, though new invasion of the blood stream and tissues occurs. This type of immunity is exemplified in normal rats which transform an ordinarily acutely fatal streptococcus infection to a chronic one. It is due to an active depression in virulence, hence the term 'depression' immunity. This type of immunity is demonstrable after 6 hours, and fully developed 24 hours after a primary infection, thus showing itself to be independent of the phenomenon of anaphylaxis which develops much later. This 'depression' immunity is a new type of immunity distinct from those included in the Ehrlich receptor theory. It is not the product of chronic infection, but the chronicity of an acute infection is rather the result of this 'depression' immunity.—B. C.

## CHEMOTHERAPY

(See also Number 1715)

1901. *The Chemotherapeutics of the Chaulmoogric Acid Series and Other Fatty Acids in Leprosy and Tuberculosis. I. Bactericidal Action; Active Principle; Specificity.* E. L. WALKER AND M. A. SWEENEY. J. Infect. Dis., Chicago, 1920, 26, 238-264.

The ancient use of chaulmoogra oil in the treatment of leprosy and the recent reports of Rogers upon the curative action of fatty acids derived from this oil led these authors to make a systematic study of the action of these substances. Their experiments show that the bactericidally active substances of chaulmoogra oil are the fatty acids, chaulmoogric and hydnocarpic acids, which are unique in containing a closed carbon ring in their molecular structure. These acids are specific against acid-fast bacteria, and are about 100 times

more active than phenol. Solutions of these acids in dilution of 1:20,000 killed cultures of *B. tuberculosis* in 24 hours. Their protective action against the lepra bacillus was studied as far as the uncertainty of the bacteriology of leprosy permitted. Using *B. leprae muris*, these fatty acids were found to be bactericidal in dilutions as high as 1:75,000. The fatty acids of cod liver oil (sodium morrhuate) were ineffectual against acid-fast bacteria. Further experimental work on the use of the chaulmoogric acids in tuberculosis is being done.—S. B.-J.

1902. *The Treatment of Leprosy; with Especial Reference to Some New Chaulmoogra Oil Derivatives.* J. T. McDONALD AND A. L. DEAN. Pub. Health Rep., Wash., 35, 1959-1974.

From results obtained in the treatment of lepers with derivatives of chaulmoogra oil, at the Leprosy Investigation Station, United States Public Health Service, Hawaii, the authors consider the following conclusions warranted:

1. The intramuscular injection of the ethyl esters of the fatty acids of chaulmoogra oil usually leads to a rapid improvement in the clinical symptoms of leprosy. In many cases the lesions disappear, except for scars and permanent injuries and the leprosy bacillus can be no longer demonstrated.

2. When combined with iodine, the fatty acids of chaulmoogra oil and their esters give good results.

3. All of the available evidence obtained from the use of fractions of the fatty acids of chaulmoogra oil indicates that the therapeutic action is due to one or more of the fatty acids of the oil or to some as yet unidentified substance associated therewith. The various methods of fractionation heretofore employed have failed to demonstrate the active agent.

4. Although conclusive evidence is not at hand, it is probable that the oral administration of chaulmoogra oil derivatives is of minor importance compared with the injections.

5. In treating leprosy, it is important to make use of all auxiliary agencies to build up and maintain bodily vigor.

6. Hypodermic injections of the ethyl esters into leprosy nodules are followed by marked swelling with ultimate recession of the lesions. This is a valuable auxiliary treatment for especially resistant lesions.—I. A. B.

1903. *Chaulmoogra Oil.* Editorial. Indian M. Rec., Calcutta, 1919, 39, 236-237.

This editorial is of interest because of the recent reports concerning the specificity of chaulmoogra oil in leprosy. This oil is purely of Indian origin. Its use is not confined to leprosy; being also used in skin diseases. Two sources of this oil were considered by the British Pharmacopoeia, *Gymocardia odorata* and *Taraktogenous kurzii*; a third source is now recognized *Hydnocarpus wightiana*; a tree which grows in South India and known as false chaulmoogra. Sir Leonard Rogers is conducting extensive researches with the sodium salt of these and other oils in the treatment of leprosy, tuberculosis and other bacterial diseases.—C. P. B.

1904. *Quantitative Studies in Chemotherapy. I. Trypanocidal Action of Antimony Compounds.*

CARL VOEGTLIN AND HOMER SMITH. With the cooperation of MARIAN M. CRANE, KATHERINE D. WRIGHT, AND MABEL A. CONNELL. J. Pharmacol. & Exper. Therap., Balt., 1920, 15, 453-473.

The authors summarize their article as follows:

"1. The specific action of antimonylactate on the trypanosomes of infected rats can be studied fairly accurately by following the disappearance of the parasites from the blood stream.

"2. A sharply defined threshold (minimum effective dose) is observed, below which the drug has no appreciable effect upon the parasites. The threshold is in part due to the nature of the reaction between the drug and the parasites and in part to absorption of the drug by the tissues of the host.

"3. The process curve is an orderly one and consistent throughout individual experiments. However, various experiments indicate two general types of reactions, differing in reaction velocity. In one type the reaction velocity remains constant throughout the experiment. In the other, the reaction velocity is constantly increasing.

"4. A method for the rapid and accurate determination of the trypanocidal power of drugs (minimum effective dose) is recommended."—F. W. H.

1905. *Quantitative Studies in Chemotherapy. II. The Trypanocidal Action of Arsenic Compounds.* CARL VOEGTLIN AND HOMER W. SMITH. With the cooperation of MARIAN M. CRANE, KATHERINE D. WRIGHT, AND MABEL A. CONNELL. J. Pharmacol. & Exper. Therap., Balt., 1920, 15, 475-493.

The following is the authors' summary:

"1. Differences in the toxicity of various arsenic preparations have been explained on the hypothesis that they must be changed to one type, namely, the trivalent oxides  $RA_2O_3$ , before exerting their principal toxic action.

"2. Differences in the trypanocidal activity of these compounds have been explained upon the same hypothesis."—F. W. H.



1906. *Arsphenamine and Neoarsphenamine*. WM. A. SMITH. J. Lab. & Clin. M., St. Louis, 1920, 5, 518-527.

Discussion of the origin, present supply, rules for the manufacture, chemistry and physical properties of arsphenamine and neoarsphenamine, the technic of their administration, reactions and their cause, their use in therapeutics and their relative values.—F. W. H.

1907. *Further Pharmacological Studies on Arsphenamine*. M. I. SMITH. J. Pharmacol. & Exper. Therap., Balt., 1920, 15, 279-295.

This article gives an analysis of the action of arsphenamine on the pulmonary circulation, discusses its toxicity following continuous intravenous injection into dogs and the relation of intermediaries to the toxicity of arsphenamine.—F. W. H.

1908. *Chemotherapeutic Studies with Ethylhydrocuprein and Mercurphen in Experimental Pneumococcus Meningitis in Rabbits*. J. A. KOLMER AND B. IDZUMI. J. Infect. Dis., Chicago, 1920, 26, 355-372.

The subtheal injection of single doses of ethylhydrocuprein in amounts of 0.5 cc. of 1:500 and 1:100 solutions per kilo of body weight had a somewhat beneficial effect upon the course of experimental meningitis in rabbits, produced by a Type I pneumococcus of moderate virulence. The administration of the drug to be of benefit should be made within 4 to 6 hours after the injection of the organisms. When given 24 hours after the pneumococci, it had no beneficial effect. In the treatment of pneumococcal meningitis in man the use of ethylhydrocuprein is recommended. The dose may safely be 0.5 cc. of a 1:1000 solution per kilo of body weight, twice daily, intraspinaly.

Similar experiments were carried out with mercurphen, boric acid, sodium oleate and combinations of these drugs with antipneumococcus serum. The results in the palliation of pneumococcal meningitis were not as satisfactory as those obtained with ethylhydrocuprein.—S. B-J.

1909. *Treatment of Disorders of the Spinal System by the Intraspinal Method and Its Value to the Business Man*. FREDERIC J. FARNELL. J. Nerv. & Ment. Dis., N. Y., 1920, 51, 420-427.

To obviate the "lay up" following the usual method of intraspinal injection of salvarsanized serum the author has adopted the technic of injecting the serum slowly into the extradural space. In all, 15 patients have been so treated; 10 of these have been freed from nearly all symptoms and the other 5 have shown improvement.—F. W. H.

1910. *Gentian Violet in the Treatment of Purulent Arthritis: With a Discussion of Allied Problems*. JOHN W. CHURCHMAN. J. Am. M. Ass., Chicago, 1920, 75, 583.

Pyogenic arthritis due to *Staphylococcus aureus* may be cured by lavage and staining. Pneumococcus and gonococcus arthritis were also cured by lavage and staining. Gentian violet actually penetrates the cell and its living nucleus. Life proceeds uninterrupted in the stained cell. If injected into the circulation gentian violet soon disappears from the blood stream. This disappearance is not caused by mere contact with the blood, nor by oxidation. When the dye is lodged in epithelial cells no rapid transportation occurs. A chemical substance which kills many bacteria of clinical importance, but does not injure tissue cells and persists for some time possesses valuable properties not found in other bacteriostatic agents. The bacteriostatic property of gentian violet finds some practical applications, namely: (1) Petroff's method for cultivation of tubercle bacilli directly from sputum and feces; (2) elimination of spurious presumptive tests for *B. coli* in water, by the use of gentian violet; (3) elimination of spurious presumptive tests in the examination of milk; (4) selective elimination of the hay bacillus from cultures of obligative anaerobes, by the use of gentian violet; (5) experiments done during the epidemic of influenza to determine whether the dye might be of use in the isolation of *B. influenzae*. It has been found that ptyalin, pepsin, trypsin, rennin and thrombin are not affected by gentian violet. Yeast cells are killed by the dye. Diphtheria and tetanus toxins are not affected, excepting a slight impairment of the potency of tetanus toxin. The ultramicroscopic organisms of rabies and vaccinia are not affected. Animals injected with stained cultures of blastomyces and staphylococcus survived while control animals died.—P. G. H.

1911. *Chemioterapia antitossica: i fenololipoidi*. (Antitoxin Chemotherapy: Phenol-lipoids.) V. C. PIAZZA. Arch. di farmacol. sper., Roma, 1920, 23, 61-64; 65-76; 81-92; 97-105.

The author works on the supposition that a good chemotherapeutic agent must have more than one action. Its properties must be complex and its effects multiple. This cannot be brought about by modifying the substance in its pharmacological powers, organotropism, or solubility, etc., but must be the resultant of two or more substances, one possessing antibacterial and the others antitoxic properties.

Phenol is one substance used on account of its parasitotropic and organotropic properties and the others are various lipoids whose antitoxic action is well established.

Piazza has sought to obtain an additional product which has the properties mentioned, namely the power to kill bacteria directly or indirectly, and the ability to neutralize the exo- and endotoxins.

Preparations were made adding various lipoids to phenol, using camphor as a connecting link in some cases. To these addition products the author has given the name of "phenol-lipoids." Thirteen different compounds were made whose physical and chemical properties were different from the original components. Of the substances prepared the "H" phenol-lipoid made from the union of phenol, cholesterin and camphor presents the most constant chemical composition, physico-chemical characteristics, and biological activity.

The toxicity of this compound for guinea pigs when injected intravenously is 1.5 grams per 100 grams of animal. Its parasitropic action is manifested by inhibiting the development of bacteria after a certain period of contact. The antitoxic action is shown by neutralizing typhoid anaphylatoxin, tetanus toxin and diphtheria toxin. There is no organotropic action of the phenol present nor is any hemolysis shown.—P. M.

1912. *Zur Behandlung der Lungengangrän mit Neosalvarsan.* (Treatment of Pulmonary Gangrene with Neosalvarsan.) JULIUS ALSBERG. Deutsche med. Wchnschr., 1920, 46, 797-798.

This is a description of several cases of pulmonary abscess and bronchiectasis which were successfully treated with neosalvarsan.—B. C.

1913. *Zur Kenntnis der ulzero-membranösen Stomatitiden (Plaut-Vincent) und ihrer Behandlung mit Salvarsan.* (The Plant-Vincent Syndrome and Its Treatment with Salvarsan.) CARL HIRSCH. München. med. Wchnschr., 1920, 67, 718-719.

It is difficult, if not impossible, to distinguish this disease clinically from tuberculosis or syphilis. Microscopic examination of the exudate is essential for diagnosis. The microscopic picture shows numerous spindle or cigar-shaped bacilli, 10-12 $\mu$  long by 0.5 $\mu$  thick, together with many short spirochetes of 3-5 twists. The fact that the infection yields rapidly to salvarsan treatment is taken as further proof that we are here dealing with spirochetes (protozoa) and not bacteria.—B. C.

1914. *Neosalvarsan bei akuten und chronischen Entzündungen des Nierenbeckens und der Blase.* (Neosalvarsan in Acute and Chronic Inflammations of the Kidney Pelvis and the Bladder.) KURT KALL. München. med. Wchnschr., 1920, 67, 541.

Intravenous injections of neosalvarsan have been found very effective in the treatment of acute and chronic inflammations of the pelvis of the kidney and the bladder caused by *B. coli*, staphylococci or gonococci.—B. C.

1915. *Erfahrungen mit Silbersalvarsan.* (Results with Silver Salvarsan.) KURT WIENER. Deutsche med. Wchnschr., 1920, 46, 680-682.

This is a succinct objective report of the results obtained in treating 321 syphilitics with this new therapeutic agent. The spirochetes disappeared in 24 hours after administration of the first dose. Primary, secondary and tertiary infections as well as the Wassermann reaction were favorably affected. Satisfactory results are obtained in certain cases by administering silver salvarsan without the customary complement of mercurial treatment.—B. C.

1916. *Ueber den Wert gleichzeitig kombinierter (simultaner) Salvarsantherapie vom klinischen Standpunkte (mit besonderer Berücksichtigung des Silbersalvarsans als Kombinationstherapie).* (The Value of Simultaneous Salvarsan Therapy from the Clinical Standpoint.) WILHELM WAGNER. München. med. Wchnschr., 1920, 67, 780-781.

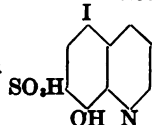
A simultaneous combination of different specific agents (as mercury and salvarsan) does not result in a summation of their individual effects in the treatment of syphilis. The net result is that of the most potent agent applied, namely salvarsan. Silver salvarsan has not been found preferable to other salvarsan compounds.—B. C.

1917. *Trypaflavin in der Dermatologie.* (Trypaflavin in Dermatology.) S. WERNER. München. med. Wchnschr., 1920, 67, 637.

Acid, or better, neutral trypaflavin is recommended as an early treatment in crust-forming eczemas, especially in the pyodermas of children. The disinfecting property of trypaflavin has been found very effective in such diseases.—B. C.

1918. *Eine neue Bubotherapie bei Ulcus molle.* (A New Therapeutic Agent for Bubo in Soft Chancre.) OTTO NAST. Deutsche med. Wchnschr., 1920, 46, 625-626.

The quinoline compound



called 'yatren' is injected in 2 to 5 per cent solu-

tion (made up in 0.4 per cent NaCl) directly into the venereal bubo. The substance has shown satisfactory bactericidal power against pus-forming organisms, and has thus helped in producing cure.—B. C.

1919. *Fleckfieber und kolloidale Silbermittel. (Typhus Fever and Colloidal Silver Remedies.)* H. E. KERSTEN. Deutsche med. Wchnschr., 1920, 46, 831-832.  
Intravenous injections of colloidal silver (collargol) in quantities of 5 cc. of a 5 per cent solution daily for a week have favorably influenced the course of typhus fever infection.—B. C.

1920. *Kollargoltherapie bei hämolytischen Ikterus? (Collargol Therapy in Hemolytic Jaundice?)* ARNOLD KIRCH. Deutsche med. Wchnschr., 1920, 46, 660.  
Rectal administration of collargol in a case of hemolytic jaundice was unsuccessful in arresting the disease.—B. C.

1921. *Aetzwirkung des Eucupins. (Irritative Effect of Eucupin.)* S. ROSENBAUM. Deutsche med. Wchnschr., 1920, 46, 521-522.  
The hydrochloride of eucupin (an internal disinfectant) has been found to possess an irritant action on the skin and on the mucosa of the mouth. The basic salt is declared to be free from this disadvantage. If the acid salt is to be administered *per os*, it should be done through a stomach tube.—B. C.

1922. *Eine neue spezifische Jodwirkung. (A New Specific Action of Iodine.)* JULIUS FINCK. München. med. Wchnschr., 1920, 67, 426-427.  
The author finds that daily administration of iodine in KI solution is an abortive and prophylactic for respiratory diseases, not only common colds, but also measles, etc. He ascribes the effect not to the killing of the bacteria, but to a disturbance in their development caused by the iodine.—B. C.

## MISCELLANEOUS

1923. *Bacteria—Friends and Foes.* D. H. JONES. Ont. Agr. College, Bull. 265. 1918.  
An illustrated, non technical, 100-page bulletin, describing bacteria and their varied work on the farm and in the home. The subject is dealt with in a popular manner under seven heads as follows: I. Bacteria of the Soil and Manure Pile—the various groups of soil bacteria are described with recommendations for soil treatment to get the best results from bacterial action, special attention being drawn to cultivation, drainage, liming and legume seed inoculation. II. Bacteria and the Water Supply—calls attention more particularly to the ways by which farm wells get contaminated and shows how the danger from such may be averted. III. Bacteria and Sewage Disposal—descriptive of and recommending the septic tank method with sub-irrigation of the effluent in rural sections. IV. Bacteria and Food Preservation—gives special attention to methods of individual canning of fruits, vegetables and meats, the microbiology of the subject being explained. V. Bacteria of Milk and Milk Products—shows the various ways by which milk is ordinarily contaminated and gives the means of prevention and control. VI. Bacteria of Infectious Diseases of Man and Animals—deals briefly with typhoid fever, dysentery, tuberculosis—human, bovine and avian—diphtheria, anthrax, symptomatic anthrax, contagious abortion of cattle and mares, hog cholera, foot-and-mouth disease, glanders, white diarrhea of chicks, fowl cholera, roup, blackhead of turkeys and foul brood of bees. VII. Bacterial Diseases of Plants—describes the following diseases and gives methods of prevention and control: Bacterial soft rot of vegetables, blackleg of potatoes, bacterial wilt of Cruciferae, bacterial wilt of cucurbits, bacteriosis of beans, bacterial blight of apple, pear and quince trees, crown gall and hairy root.—D. H. J.

1924. *Klinische, anatomische und ätiologische Krankheitsbegriffe und Krankheitsnamen. (Clinical, Anatomical and Etiological Concepts of Disease and Their Nomenclature.)* FELIX MARCHANT. München. med. Wchnschr., 1920, 67, 681-686.  
Disease nomenclature is in somewhat of a chaotic state, but any artificial scheme or system would be in vain because life phenomena are involved and not ontologic units. A certain division into categories according to chief characteristics is conceivable, but the introduction of a new nomenclature would be beset with great difficulties because views on the nature and cause of disease processes vary with the contemporary state of knowledge.—B. C.

1925. *The Influence of Thorium X on Antibody Formation.* L. HEKTOEN AND H. J. CORPER. J. Infect. Dis., Chicago, 1920, 26, 330-335.  
Thorium X was injected intravenously into rabbits at various periods during the immunization of these animals to sheep's blood. The thorium usually reduced the leucocytes in the blood, but had a variable effect upon the formation of antibodies. In rabbits treated with thorium X in the early stages of antibody production, the formation of precipitins was diminished, even when there was no leucopenia. When precipitin production was well under way, on the sixth day after the injection of the antigen, thorium X had no effect upon the final titer of this antibody. Injections of thorium X had no effect upon the formation of lysin.—S. B-J.

1926. *Zur Lehre von dem Gewebsschutz. (Study on Tissue Defense.)* A. THEILHABER AND H. RIEGER. München. med. Wchnschr., 1920, 67, 368-369.

The resistance that tissues offer to attacks of foreign invaders is due to the presence in great numbers of the large round-celled lymphocytes and connective tissue cells. A reduction in tissue defense also occurs with reduction in function (atrophy) of the hematopoietic organs.—B. C.

1927. *Ueber Eigenblutinfusion. (Blood Reinfusion.)* A. DÖDERLEIN. Deutsche med. Wchnschr., 1920, 46, 449-451.

It often happens during necessary surgical intervention at childbirth, that the mother succumbs because of excessive hemorrhage. Prompt infusion of the extravasated blood collected from the body cavity will frequently save the patient. The blood is scooped out, filtered through gauze, citrated and infused through any large vein available.—B. C.

1928. *Affinitätskrankheiten und lokaler Gewebsschutz. IV. ('Affinity' Diseases and Local Tissue Defense. IV.)* ERNST HEILNER. München. med. Wchnschr., 1920, 67, 501-503.

Heilner believes that certain normal end-products or intermediates of metabolism have an affinity for one another or kind of tissue in the body, as uric acid has for articular cartilage, thus producing what he terms 'affinity' diseases. Normally, however, he believes that each tissue is active in maintaining an affinity-defense which prevents the accumulation of these products locally. When the defense is lost, perhaps because of damage during some infection, localization of these physiological products occurs and the pathological state of gout, arteriosclerosis and perhaps certain nephropathies appears. To reinstate active 'affinity' defense, the author resorts to injections of normal cartilage preparations for gout and of blood vessel preparations for arteriosclerosis.—B. C.

1929. *Beiträge zur Kenntnis der Leichveränderung bei Haustieren. (Postmortem Changes in Domestic Animals.)* W. FREI AND TH. AMHERDT. Arch. f. wissensch. u. prakt. Tierh., Berl., 1918, 44, 303-371.

The death of the organism occurs when the activities of the mind, heart and respiratory organs have stopped. With it, however, all organs and cells do not die. The authors give interesting data upon the longevity of various cells in different animals after such animals have been pronounced dead. Autolysis, through intracellular ferments, causes the first changes. This results in the ripening of meat and of course does not make the meat unfit for human consumption. Autolysis is displaced by putrefaction, resistance to which is greatest in bones and cornified tissues; it decreases in approximately the following order: intestines, skin, muscles, lungs, heart, kidneys, spleen and liver.

The authors also discuss at length *rigor mortis* and its disappearance.—J. T.

1930. *The Regeneration of Smooth Muscle Cells.* FRANK B. BERRY. J. Med. Research, Bost., 1920, 41, 365-371.

A case is reported where unquestionable regeneration of smooth muscle was noted in a human uterus. The author believes that this is the only case on record where regeneration of smooth muscle in the human has been noted. Experimental work on 2 rabbits and 3 guinea pigs confirmed the observation.—A. C. E.

1931. *Action of Chloretone on Animal Tissue.* T. B. ALDRICH AND H. C. WARD. J. Lab. & Clin. M., St. Louis, 1920, 5, 583-586.

The authors find that chloretone in saturated aqueous solution is bactericidal at all temperatures, prevents the growth of common moulds, does not inhibit autolytic action, is not suitable as a fixative for histologic materials but is useful in preserving glands and gland extracts from which active principles are to be obtained.—F. W. H.



THIS NUMBER COMPLETES VOLUME IV

VOLUME IV

NUMBER 6

# ABSTRACTS OF BACTERIOLOGY

UNDER THE EDITORIAL DIRECTION OF THE  
SOCIETY OF AMERICAN BACTERIOLOGISTS

DECEMBER, 1920

EDITOR

A. PARKER HITCHENS



*It is characteristic of Science and Progress that they continually  
open new fields to our vision.—PASTEUR*

PUBLISHED BI-MONTHLY  
FOR THE SOCIETY OF AMERICAN BACTERIOLOGISTS BY  
WILLIAMS & WILKINS COMPANY  
BALTIMORE, U. S. A.

Entered as second-class matter April 30, 1917, at the Post-Office at Baltimore, Maryland,  
under the Act of March 3, 1879

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OFFICIAL ORGAN OF THE SOCIETY OF AMERICAN BACTERIOLOGISTS

DEVOTED TO THE ADVANCEMENT AND DISSEMINATION OF KNOWLEDGE  
IN REGARD TO THE BACTERIA AND OTHER MICRO-ORGANISMS

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Vol. V. No. 6

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## ABSTRACTS OF BACTERIOLOGICAL LITERATURE

### HISTORY, BIOGRAPHY, LITERATURE

1932. *Some Bacteriological Aspects of Dehydration. Address of President, Annual Meeting, Society of American Bacteriologists, 1919.* SAMUEL C. PRESCOTT. J. Bact., Balt., 1920, 5, 109-125.

Under the press of war-time necessity the preparation of dehydrated foods was markedly stimulated. Many of the problems involved in the processes are of considerable economic importance and have been made the object of careful study. Of the bacteriological aspects only a beginning has been made. One of the primary objects of dehydration is concerned with the preservation of the food—desiccation being carried to such a point that enzymes and microorganisms are completely or nearly completely inactivated. Dehydrated vegetables generally contain less than 10 per cent of water. They have usually been subjected to a pretreatment by hot water or steam and a washing, followed by desiccation for from 3 to 24 hours at temperatures ranging from 55° to 85°C. When soaked in water these dehydrated vegetables will reabsorb water and assume their previous, normal appearance. Samples of dried foods have shown the presence of bacteria and mold spores but not of yeasts. Products from different manufacturers showed counts of from less than 100 to 2,000,000 bacteria per gram. Practically all the species found represent soil or water forms. All of the molds which have been isolated are organisms which may be found on fresh vegetables or fruits. The flora of dehydrated products is similar to that of the raw materials but shows evidence of reduction in the number of organisms. The reduction is probably produced by the processes to which the foods have been subjected. Experiments indicated that storage in tin and glass containers under all practical conditions of temperature and humidity does not affect the moisture or mold content and results in diminution in the number of viable bacteria present. Storage in paper or wood pulp containers of good quality under ordinary conditions gives satisfactory results. At higher temperatures and humidities the dehydrated foods absorb water and show changes in their bacterial and mold flora. Preliminary experiments have been conducted to determine the extent of the danger of food poisoning outbreaks through the use of dehydrated foods. Inoculations with *B. coli*, *B. typhosus*, *B. paratyphosus* A and B, *B. enteritidis*, *B. paracoli*, *B. subtilis*, *B. Welchii*, *B. suispestifer*, *B. murisepticum*, *B. botulinus*, *Microspira protea*, *Micrococcus pyogenes aureus*, and *B. diphtheriae* were followed and the results were considered reassuring. The preliminary experiments indicate that most pathogens are either destroyed or are very materially reduced in number in the course of dehydration.—I. S. F.

1933. *On the Nature of Bacterial Toxemia.* HANS ZINSSER. J. Immunol., Balt. & Cambridge, Eng., 1920, 5, 265-295.

This is a general consideration of the problem given in the presidential address at the annual meeting of the American Association of Immunologists, April 1, 1920. The theories of Pfeiffer, Vaughan, Ulrich, Friedmann, Friedberger and Thiele and Embleton are critically reviewed. A consideration of the facts presented shows that a simple answer for the complex problem is quite out of the question. The author throws some new light on the problem from his own work in which he shows that young cultures of many pathogenic and some non-pathogenic bacteria both Gram-negative and Gram-positive produce toxic substances. Filtrates and centrifugates from such young cultures were highly toxic for rabbits.

I. Endotoxin theory. Pfeiffer's view. In cholera, injury due to poisons liberated from the bacterial cell upon dissolution occurring under influence of bacteriolytic serum constituents. Endotoxins are not conceived as possessing antitoxin inciting properties.

II. Vaughan supported by Ulrich Friedmann. Poisonous properties are not due to the effects of preformed liberated poisons but to the proteolytic cleavage of the bacterial cell plasma.

III. Friedberger. Anaphylatoxins. The bacteria are digested first with amboceptor and alexin, later by treatment with normal guinea pig serum alone. Endotoxins in the original sense do not exist. Bacteria on entrance to the body are subject to sensitizers in normal serum; in the course of a cleavage a toxic split protein product is formed analogous to that obtained by Vaughan by chemical methods. This becomes non-toxic as proteolysis continues. In the animal body it does not occur with sufficient speed to produce acute death. The continuous production of small amounts of this poison, constitutes the basic manifestations of every infection, local inflammation, fever and injury to the central nervous system. This occurs not because of any specific difference in nature of the poison.

IV. Thiele and Embleton. The endotoxic action of bacteria is referable to products from the cleavage of bacterial protoplasm by antibodies and that pathogenic bacteria are those against which antibody activities are either "so low" that toxic substances are liber-



ated only in extremely small amounts or "so high" that degradation of the protoplasm takes place with a rapidity that precludes the intermediate toxic substances. Between lie the true pathogens.

V. Zinsser. Young cultures produce poisons toxic for rabbits.—R. R. H.

1934. *The Medical Teacher*. KENNETH M. LYNCH. South. M. J., Birmingham, 1920, 13, 607-610.

An article dealing with the economic side of the teaching situation and a plea for better recognition of the work of those teaching the laboratory branches.—J. H. B.

## CHARACTERIZATION AND CLASSIFICATION

(See also Numbers 1948, 2814)

1935. *The Families and Genera of the Bacteria. Final Report of the Committee of the Society of American Bacteriologists on Characterization and Classification of Bacterial Types*. C.-E. A. WINSLOW, Chairman, JEAN BROADHURST, R. E. BUCHANAN, CHARLES KRUMWIEDE, JR., L. A. ROGERS, AND G. H. SMITH. *J. Bact.*, Balt., 1920, 5, 191-229.

This presents, in the opinion of the committee, the most reasonable outline of the true biological relations among the bacteria. It is not intended as a definitive scheme of classification but rather as a working key to the biological relationships, based upon the best interpretation of available knowledge of the 38 genera which comprise the Orders Actinomycetales and Eubacteriales, the fourth and fifth orders of the Class Schizomycetes. The committee has deemed it wise to adopt the suggestion of the committee on generic types of the Botanical Society of America and to use type species to distinguish genera rather than to attempt generic characterization. Only brief characterizations of genera are given with the type species of the genera. The chief departures from the 1917 classification are the following:

The family Mycobacteriaceae has been elevated to the rank of the Order Actinomycetales, and divided into two families, Actinomycetaceae (to which have been added the genera *Actinobacillus* and *Erysipelothrix*, and from which *Nocardia* has been omitted) and Mycobacteriaceae (to which the genus *Pfeifferella* has been added). The Nitrobacteriaceae have been divided into the two tribes Nitrobacterae and Azotobacterae, with *Rhizobium* included in the family. *Acetobacter* has been substituted for *Mycoderma*, the vinegar organisms. Among the Coccaceae a new tribe was created for the genus *Neisseria*; the genus *Albococcus* is united with *Staphylococcus*; and the new genera *Diplococcus* and *Leuconostac* are added. The Bacteriaceae are divided into seven tribes: Chromobacterae, Erwinae, Bacterae, Lactobacillae, Pasteurellae, Hemophilae, and Zopfiae; and the new genera *Erythrobacillus*, *Chromobacterium*, *Zopfius*, and *Proteus* are added. The Lactobacillaceae, originally recognized as a distinct family, are thus classed as a tribe of the Bacteriaceae.

An artificial key to the families and the genera of the Actinomycetales and the Eubacteriales has been prepared. This will probably prove very valuable for use by students. A generic index of the commoner forms of bacteria, prepared for the committee by D. F. Holland, presents in convenient form a reference source to show how the names of species commonly found in the literature should be changed to correspond with the generic classification suggested by the Committee.—I. S. F.

1936. *Report of the Committee on the Descriptive Chart for 1919*. H. J. CONN, Chairman, H. A. HARDING, I. S. KLIGLER, W. D. FROST, M. J. PRUCHA, AND K. N. ATKINS. *J. Bact.*, Balt., 1920, 5, 127-143.

The present report is a revision of the 1917 report of the committee and contains a description of the methods which are considered the best available for the studies called for by the instruction chart. The use of suitable indicators in the adjustment of media to "true neutrality" and the use of indicators in combinations are recommended. Although the committee recommends the use of certain standard media, variations from the suggested formulae are considered acceptable provided the variations are specified on the descriptive chart. A scheme is outlined for the invigoration and preliminary grouping of cultures by the use of glucose broth and agar slants, 25°C. and 37°C. incubation temperatures, and 24 and 48 hour incubation periods. In the routine study of morphology, the committee makes recommendations of the best available methods for the determination of motility, spore formation, presence of capsule and irregular forms. Special attention is given to staining by Gram's method and particularly to the Stirling modification. For the study of the liquefaction of gelatin the old method (incubation of plain gelatin stab cultures for 6 weeks at 20°C.) is recommended. Rothberg's method for the differentiation of "true liquefiers" (producing ecto-enzymes) and pseudo-liquefiers is suggested provisionally. In determination of the relation to free oxygen the committee recommends the use of fermentation tubes and of a broth containing a sugar from which the organism cannot produce free gas. Fermentation of sugars and glycerol is to be studied in fermentation tubes. To test for acid, the titrametric method is to be replaced by the determination of hydrogen-ion concentration. Two tables present an admirable key for the approximate determination of hydrogen-ion concentration in fermentation broths and in milk when standards of known hydrogen-ion concentrations are not available. To determine the reduction of nitrates the sulphanilic acid-naphthylamine method is recommended. Workers are cautioned against the shortcomings of the test and

the liability to error. Diastatic action on starch is to be measured by the width of the clear area after flooding with iodine solution surrounding growth on starch-agar. The group number is retained as a brief record of an organism's salient feature. Its revision for the nomenclature which has largely replaced Migula's will be presented in a later report of the committee. A complete glossary of the terms used on the chart is appended to this report.—I. S. F.

1937. *A Laboratory Chart for Recording Observations on Microorganisms*. FRED W. TANNER. J. Lab. & Clin. M., St. Louis, 1920, 5, 792-797.

A modification of the Descriptive Chart of the Society of American Bacteriologists and of that of the Laboratories of Bacteriology of the Michigan Agricultural College adapted to the use of students.—F. W. H.

1938. *Notes on the Classification of the White and Orange Staphylococci*. C.-E. A. WINSLOW, WILLIAM ROTHBERG AND ELIZABETH I. PARSONS. J. Bact., Balt., 1920, 5, 145-167.

A total of 180 strains of white and orange cocci, 104 from pathological conditions in men and animals, 22 isolated from the hands and 54 from air, dust and water were studied with respect to cultural reactions. Of the carbohydrates, glucose, lactose, sucrose, maltose, raffinose, mannitol, dulcitol, salicin and inulin were studied. Hydrogen-ion concentrations were measured by the colorimetric method. The strains isolated from pathological conditions tend to show more vigorous fermentative power. Gelatin liquefaction is somewhat more common among active fermenters. White and orange pigments were fairly evenly divided among the various fermentative groups.

From these studies the authors are inclined to consider that the orange and the white cocci belong to a single generic group (contraverting the earlier separation into two groups by the Winslows, which should bear the name *Staphylococcus*). Chromogenesis, liquefaction of gelatin and fermentation of lactose remain as the chief differential characters available for classification. In establishing types, the organisms which produce an orange pigment, liquefy gelatin and are strong fermenters (lactose positive) may be chosen as a central type. All others are conceivable as modifications which have lost one or more physiological properties. This central type is given the name *Staphylococcus aureus*.

"The most typical and more vigorous staphylococci are the characteristic forms found associated with pathological conditions, the types of weaker biochemical powers are the ones most frequently isolated from sources outside the human body. This may plausibly be explained on the assumption that the loss of the biochemical powers characteristic of the typical *Staphylococcus aureus* is promoted by the unfavorable conditions of life outside the human body."—I. S. F.

1939. *Further Studies on the Specificity of Streptococci*. RUTH TUNNICLIFF. J. Am. M. Ass., Chicago, 1920, 75, 1339.

Hemolytic streptococci from the acute stage of scarlet fever form a distinct biologic group as shown by the effect of sheep serum obtained by immunizing sheep with streptococci from the throat of patients in the acute stage of scarlet fever. This serum did not protect against hemolytic streptococci from erysipelas, mastoiditis and influenza. Hemolytic streptococci from erysipelas also form a distinct group.—P. G. H.

1940. *On the Solution of Pneumococci by Bile*. F. B. KELLY. Am. J. Pub. Health, 1920, 10, 708-712.

The present experiments confirm many of the observations of earlier workers on the phenomenon of pneumococcus solubility in bile solution. Using various strains of pneumococci and streptococci, the author finds bile solubility reaction of considerable specificity. Different samples of bile solutions of bile salts vary in their lytic power. Inspissated bile showed the strongest action. Sugar, in the culture medium, was found to have an inhibiting action on the lytic property of bile on pneumococci. The author concludes from his experiments that if "a coccus dissolves it is undoubtedly a pneumococcus; but if a solution is only partial, this fact does not necessarily rule out the possibility of the strain belonging to this group." Suspensions of the bacteria in salt solutions were found superior to broth cultures because of the absence of interfering color and because of the greater constancy of composition and bacterial concentration.—I. S. F.

1941. *Types of Pneumococci in the Throats of One Hundred Normal Persons*. JACOB MEYER. J. Am. M. Ass., Chicago, 1920, 75, 1268.

One hundred normal individuals were examined during February, March and April, 1920, following an influenza epidemic in Chicago. Swabs from the pharynx and tonsils were spread on 5 per cent goat blood agar and typical colonies transferred to broth. Identification was made by bile solubility and fermentation of inulin. Pneumococci were found in 21 cases. Types I and II were not found. Type II A was found once. Type III occurred in three cases and Type IV in 17.—P. G. H.

1942. *Bidrag till frågan om förekomsten av s.k. parameningokocker. (The Question of the Origin of the So-called Parameningococcus.)* LOUIS CRANSTEDT. Hygiea, Stockholm, 1920, 82, 289-299.

Thirteen strains of meningococci recovered from the throats of contacts with a fatal case of meningitis and presumably originally from the same source were tested for aggluti-

nation properties with two monovalent serums and with two polyvalent serums. A monovalent serum produced from one of the 13 strains, agglutinated 70 per cent of the cultures, while a monovalent serum produced from a strain isolated in another locality agglutinated most of the cultures in somewhat lower dilutions. The two polyvalent serums gave different results and moreover the same serum tested with different generations of the cultures gave inconsistent results. Some of the cultures on later tests had lost their agglutinating properties and others acquired increased agglutinating properties. The study therefore shows some strains of meningococcus in older generations may acquire the properties considered by Dopter as characteristic of parameningococci and vice versa.—I. A. B.

1943. *Untersuchungen über diphtheroide Bazillen. (Diphtheroid Bacilli.)* WALDEMAR LOEWENTHAL. Schweiz. med. Wchnschr., 1920, No. 22, 421-424.

Several strains of diphtheroid bacilli were isolated from guinea pigs. Cultural and immunological studies are given in detail.—G. H. S.

1944. *An Investigation of the Acid Fastness of Tubercle Bacilli. II.* B. SUYENAGA. Am. Rev. Tuberc., Balt., 1920, 4, 526-530.

In rapidly growing cultures of tubercle bacilli, both acid-fast and non-acid fast organisms are found. The author's purpose was to determine whether or not there were two distinct types, possibly by mutation. By the use of gentian violet on divided plates and by the sodium hydroxide method for cultivating tubercle bacilli, no evidence of distinct types could be found. Acid-fast and non-acid-fast bacilli were always present together. Since the marginal growth of cultures showed more non-acid-fast bacilli than the central portion, probably the younger organisms are non-acid-fast for a short time at least. Gentian violet had a stronger bactericidal and inhibitory power than methylene blue over saprophytic acid-fast organisms. There was found to be considerable difference between the bactericidal and inhibitory power of these dyes. The bacilli less acid-fast are more susceptible to the dyes.—T. G. H.

1945. *Dysentery and Allied Bacilli.* M. LEVINE. J. Infect. Dis., Chicago, 1920, 27, 31-39.

Observations upon 111 strains of dysentery bacilli, collected in France and England during the war, and from various laboratories here and abroad, indicate that:

"The strains of *B. dysenteriae* Y used in different laboratories are not of the same serological group.

"The main groups of the dysentery and closely allied bacilli *B. dys.* Shiga, *B. flexneri*, *B. ambiguus*, *B. alkalescens*, and *B. dispar* are readily differentiated by fermentation reactions. *B. dys.* Sonne is intermediate between *B. dispar* and *B. flexneri*.

"Subdivisions of *B. flexneri* on fermentation reactions is not advisable, but the Z-race seems to be characterized by acid production from rhamnose, which is correlated with an inability to attack raffinose when sucrose is fermented.

"*B. alkalescens* and *B. dispar* form acid from glucose rapidly in a medium containing 1.5 per cent peptone, 0.4 per cent potassium phosphate and 0.2 per cent glucose, and then revert rapidly to an alkaline reaction. *B. dys.* Shiga, *B. flexneri*, and *B. ambiguus* form acid less rapidly and remain permanently acid or become alkaline very slowly."

Dyes such as eosin and methylene blue, fuchsin, rosolic acid or china blue inhibit many strains of dysentery bacilli, especially those of the Shiga type.—S. B-J.

1946. *On the Nature of Bacteria.* H. BERGSTRAND. J. Infect. Dis., Chicago, 1920, 27, 1-22.

This paper is a summary of the work of Bergstrand, in Sweden, Löhnis and Smith in this country, and of others upon cycles of development in the life history of bacteria. Illustrations are given showing the branching and apparently budding forms, cysts, granules, and zooglea-like stages of such pleomorphic microorganisms as *B. azobacter*, *B. tuberculosis*, *B. diphtheriae*, and the typhoid bacilli. The author thinks that the evidence is opposed to the view of Cohn and Lotz that the fission fungi have a constancy of forms which possess morphologic independence. Bergstrand finds that bacteria may grow as long or short buds; one form may develop from the other, from a coccus may grow a rod, and that endospores are related to and probably homologous with the chlamydospores of fungi. Condensed clumps of protoplasm in the threads of such organisms as *Actinomyces* may be found in most bacteria, and these masses of protoplasm may give rise to the original type of bacterium. It is thought that the opinion of Zopf has been substantiated "in that bacteria may be regarded as *Fungi imperfecti* developed through reduction of higher forms and not as lowly primordial organisms to be placed at the very beginning of the organic world."—S. B-J.

1947. *Ueber die Bewegung der Spirochete pallida. (The Motility of Spirocheta pallida.)* F. W. OELZE. München. med. Wchnschr., 1920, 67, 921-923.

*Spirocheta pallida* may be readily differentiated from non-pathogenic mouth spirochetes, especially *Sp. dentium*, by its characteristic mode of locomotion. *Pallida* however, quickly loses its motility upon exposure to oxygen, as it does when mixed with blood. In fresh preparations it has a characteristic rotatory motion which gives the impression of pendular swinging back and forth. In addition, it possesses a bending movement. Yet, aside from changing its relative position by several microns, *Sp. pallida* is practically non-motile in serum preparations. On the other hand, in semi-solid media, and in accumulations of cell debris, it moves in a very energetic fashion.—B. C.

## NEW SPECIES

(See also Numbers 2000, 2005)

1948. *A Comparison of the Morphologic, Cultural and Biochemical Characteristics of B. abortus and B. melitensis. Studies on the Genus Brucella Nov. Gen. I.* K. F. MEYER AND E. B. SHAW. J. Infect. Dis., Chicago, 1920, 27, 173-184.

The opinion expressed by Evans in 1918 that *B. abortus* and "*Micrococcus*" *melitensis* are closely related microorganisms was the starting point of the work reported in this paper. The authors studied the morphology and biochemical reactions of 21 cultures of "*Micrococcus*" *melitensis* from laboratories in the United States, England, Algiers and Italy, and compared their features with 32 strains of *B. abortus* (Bang).

The stock cultures designated "*Micrococcus*" *melitensis*, when grown on peptic digest agar or broth with reaction pH 7.2-7.4 for 24 hours at 37°C., showed in preparations stained with gentian violet short stumpy egg-shaped or oval rods, frequently tapered at both ends. The Malta fever organisms were always Gram-negative and did not possess flagella. The organism is morphologically similar to *B. abortus*, and should not be designated as a micrococcus, but as *Bacterium melitensis*.

In cultures the stock strains of *B. melitensis* showed less variation in their oxygen requirements than freshly isolated strains of *B. abortus*, although cultures from guinea pigs inoculated with the Malta fever organism required reduced oxygen tension for growth. The growth of each organism is facilitated by the so-called "hormone" media. The optimum reaction for the growth of each organism is pH 7.2-7.4.

Colony formation and general cultural characteristics of each organism are described in detail, showing a close parallelism between the two. Both produce brown pigment in gelatin without liquefaction. Pigment production is more intense by *B. melitensis*. Indol is not produced by either. Both render milk alkaline, and the usual carbohydrates are not fermented, the broth containing these sugars being made alkaline by both organisms.

It is proposed that a genus, called *Brucella*, be created in the family Bacteriaceae, for these distinctive coccobacillary organisms.—S. B-J.

1949. *Principles in Serologic Grouping of B. abortus and B. melitensis. Correlation between Absorption and Agglutination Tests. Studies on the Genus Brucella. Nov. Gen. II.* M. L. FENSIER AND K. F. MEYER. J. Infect. Dis., Chicago, 1920, 27, 185-206.

Rabbits and monkeys were treated by intravenous injections of bacterial emulsions of a number of strains of *B. abortus*, *B. melitensis* and *B. paramelitensis*. The serums of these animals contained agglutinins and were used in elaborate agglutination and absorption tests to study the serologic relationship between *B. abortus* and *B. melitensis*, which in a previous paper were shown to be closely allied in their morphological and cultural characteristics. A series of absorption tests with formalized suspensions of the bacteria in antisera to authentic strains of *B. abortus* and *B. melitensis* led to a four-fold grouping of these organisms. Groups 1 and 4 were represented by 2 strains each, Group 3 by 1 strain, and Group 2 by the majority of the strains. All strains of *B. abortus* and 1 strain of *B. melitensis* belonged serologically to Group 1. Antisera for the *melitensis* strains comprising Group 2 also contained agglutinins in low titer for *B. abortus*, showing that Groups 1 and 2 are closely related. The groups were as follows:

- Group 1. *Melitensis*, strain 20, *Abortus* strain 80 (and all others).
- Group 2. *Melitensis*, strains 18, 19, 21, 2, 6, 8, 11, 655, 10.
- Group 3. *Melitensis*, strain 7.
- Group 4. *Paramelitensis*, strains 22, 23.

The sera of cows and hogs suffering from natural abortion disease agglutinated both *B. abortus* and *B. melitensis*.

From the results of many absorption reactions, the author enumerates the following principles of serologic bacterial relationship:

1. An antiserum cannot be exhausted by absorption with strains of another group. It is always exhausted by its homologous strain and may be exhausted by other members of the same group.
2. A strain acts in a uniform manner (qualitatively) on all strains in another group under the same absorbing conditions. This uniform action constitutes the basis for group affiliations.
3. Strains within the same group do not necessarily act in a uniform manner on one another under the same absorbing conditions. This constitutes the basis of individual differentiation.—S. B-J.

1950. *Untersuchungen an thermophilen und kryophilen Hefen. (Studies on Thermophilic and Cryophilic Yeasts.)* GABRIELA CHABORSKI. Bull. Soc. botan. de Geneve, 1919, 70-116. (Abstr. in Ztschr. f. d. ges. Brau., 1920, 43, 134.)

The author isolated *Zygosaccharomyces ficiola* n. sp. and *Torula botryoidea* n. sp. from figs, two species of *Mycoderma*, two species of *Torula* and a new species and genus, *Asporomyces asporus* from bananas, and several species of *Mycoderma* from the juice of palm. Some are noteworthy in growing at relatively high temperature (31°C.).—R. E. B.

## BACTERIAL NUTRITION AND METABOLISM

(See also Number 1950)

1951. *The Production of Hydrogen Sulphide by Bacteria.* JOHN T. MEYERS. J. Bact., Balt., 1920, 5, 231-252.

The delicacy of the  $H_2S$  test of Redfield was studied with the object of determining its value in measurement of the potability of water. Several brands of peptone in NaCl solution, with filter paper moistened in lead acetate solution as indicator, were tested with fecal material of human, bovine, horse, sheep, pig, chicken, rabbit and dog origin. There was a fairly definite relationship between the amount of fecal material in a solution and the amount of  $H_2S$  formed. There was no constant difference between the amount of  $H_2S$  produced by human and animal fecal material; no constant relationship between the number of colon bacilli from different animals and the amount or rate of  $H_2S$  production and no definite relationship with the numbers of other organisms present. All "potable" waters which gave evidence of contamination (by fermentation tube or Endo plate methods) were positive to the  $H_2S$  test; many waters negative to other tests were positive to the  $H_2S$  test.  $H_2S$  formation is influenced by the brand of peptone used for the test. Glucose and lactose had practically no effect on  $H_2S$  formation. From another series of studies it appears that glucose, levulose, galactose, lactose, sucrose and salicin showed no marked constant effect on  $H_2S$  formation. Using several brands of peptone as sources, all strains of *B. typhosus* studied always produced large amounts of  $H_2S$  in 24 hours or less; *B. dysenteriae* never produced appreciable quantities in 24 hours. *B. paratyphosus* B always formed  $H_2S$  in 24 hours or less; *B. paratyphosus* A formed practically none in a week. Oxidized sulphur in the form of sodium sulphate or taurin was attacked not at all or only to a limited extent. Partially reduced sulphur, as in cystin, is completely reduced to  $H_2S$ .—I. S. F.

1952. *The Use of Tissue Broth in the Production of Diphtheria Toxin.* G. H. ROBINSON AND P. D. MEADER. J. Infect. Dis., Chicago, 1920, 27, 106-114.

"Diphtheria toxin can be produced regularly in broth to which pieces of sterile guinea-pig liver have been added." The authors used a "hormone" veal broth, with reaction adjusted to 0.3 per cent acid or neutral to phenolphthalein. The broth was sterilized in the autoclave as usual, and to each flask of 125 cc. a small piece of sterile guinea pig liver was then added. Eleven strains of *B. diphtheriae* were used in studies of toxin production in this medium. Only one strain failed to produce toxin, while the others produced potent toxins (0.02 to 0.04 cc. per M. L. D.) in about 5 days. Control cultures with various peptone in the same sort of hormone veal broth allowed only a slower production of a generally weaker toxin. The broth at the time of testing for toxin should have a reaction of pH 8 to 8.3. Fresh liver tissue in this broth was found to have a very important effect upon the formation of toxin, although the manner in which the tissue acts upon the metabolism of the organism is not definitely known.—S. B-J.

1953. *On the Toxin for Leucocytes Produced by Streptococci (Streptoleukocidin).* Y. NAKAYAMA. J. Infect. Dis., Chicago, 1920, 27, 86-100.

The effect of bacteria-free filtrates of cultures of streptococci in broth containing 10 per cent serum upon leucocytes was studied by the same method used to demonstrate the toxin for leucocytes which staphylococci produce. The tests for streptoleukocidin were made by a microscopic method, in which a mixture of the fluid to be tested and a suspension of leucocytes is examined on a warm stage, and by a bioscopic method, in which the ability of the leucocytes to reduce methylene blue is observed. Under the action of the substances in the cultures of streptococci, leucocytes lose their ameboid movement, develop vesicles, become granular with irregular nuclei and may finally dissolve. The technic of the bioscopic method is described in detail. Active leucocytes reduce methylene blue to a colorless fluid, while those injured by streptococci allow the fluid to remain blue or green, showing that the dye has not been reduced.

Streptococci, hemolytic as well as non-hemolytic, produce leukocidin when the organisms are virulent, but do not do so when they are not virulent. Leukocidin production by streptococci is independent of the formation of acid in the cultures. The largest amount of leukocidin is produced in broth with 10 per cent goat or horse serum, considerably less in the presence of rabbit and guinea pig serum. The maximum amount of leukocidin is produced in cultures between 10 and 24 hours after seeding. The rapidity of the action of leukocidin upon leucocytes is dependent upon the concentration of this toxin, a large amount completing its action in 30 minutes to 1 hour, while smaller amounts require 2 to 3 hours for the same effect. Cells from the organs of rabbits are more resistant than leucocytes to this toxin. Streptoleukocidin is destroyed by heat at 58-60°C. for one-half hour, and cannot be reactivated by the addition of small amounts of the fresh filtrate. The toxin unites with leucocytes and can be removed with these cells from the fluids. Streptolysin and streptoleukocidin have many points of similarity, but are not identical—one may be produced without the other, and the leukocidin can be absorbed and removed from fluids which contain hemolysin, leaving the hemolysin free to act on erythrocytes. Normal serum of various animals possesses slight ability to neutralize leukocidin. Antistreptococcus serum, however, has a distinctly greater antileukocidal action than normal serum. The serum of a rabbit immunized by injections of leukocidal filtrates of streptococci neutralizes streptoleukocidin, but does not neutralize streptohemolysin.—S. B-J.

1954. *Observations on Changes in Virulence of Hemolytic Streptococci, with Special Reference to Immune Reactions.* Y. NAKAYAMA. J. Infect. Dis., Chicago, 1920, 27, 270-280.

This paper includes brief reports on numerous and varied experiments in the study of hemolytic streptococci at different stages of virulence. The virulence of a streptococcus decreases rapidly on cultivation on blood agar. The amount of peptone in the medium does not seem to influence the virulence so much as the reaction, acid reaction, 0.8 per cent acid to phenolphthalein maintaining virulence better than alkaline reaction. Virulence persists longer in anaerobic than in aerobic cultures.

Virulence is increased when streptococci, enclosed in a collodion sac, are placed in the peritoneal cavity of a rabbit. Passage of streptococci through rabbits increases the virulence for both rabbits and mice, when the original degree of virulence for either or both animals is not at the maximum.

In the agglutination tests with streptococci a small amount of cinnabar added to the fluid prevented spontaneous agglutination. On passage through rabbits, a strain of *Streptococcus pyogenes* became less agglutinable during the time when its virulence was increasing. A similar decrease in precipitability of its extracts and a lowered susceptibility to opsonins occurred during this phase of increasing virulence. No differences, however, were demonstrable by complement fixation tests.

All strains of whatever degree of virulence were agglutinated by acid solutions of the same strength (pH not stated).—S. B-J.

1955. *The Effect of Carbohydrate on Amino Acid Utilization of Certain Bacteria.* H. M. JONES. J. Infect. Dis., Chicago, 1920, 27, 169-172.

Cultures of *B. proteus* were grown in 4 per cent dextrose peptone solution and normal NaOH was added from time to time to keep the reaction of the medium neutral. Although the culture was maintained at a reaction almost neutral (pH 7.2 by the hydrogen electrode) for 32 days, no evidence of "normal nitrogen metabolism" could be detected. The proteolytic enzyme had not appeared, indol was not formed, ammonia production was not greater than in the untitrated control, and sugar was still present in the medium.

This experiment was done to show that sufficient carbohydrate (more than the amount used by Hermann and Rettger) effectually spares protein in the medium, greatly decreasing the utilization of amino acids by the microorganisms.

The softening of gelatin occurring in sugar-gelatin medium is shown to be due to the formation of acid and not necessarily to an enzymatic hydrolysis.—S. B-J.

1956. *Die Säurefestigkeit bei fettspeichernden Mikroben.* (The Acid Fast Character in Fat-Storing Microorganisms.) PAUL LINDNER. Wehnschr. f. Brau., 1920, 37, 281-287.

The author discusses the fat content of the so-called fat secreting or fat fixing microorganisms, including the bacteria, yeasts and certain of the fungi. Methods of differentiating in the cell between esters, fatty acids and neutral fat are listed and described. The relationship of fat and fatty acid to the acid fast character of many microorganisms is discussed.—R. E. B.

1957. *Über farbstoffbildende Hefen. Eine neue biologische Reaktion auf Eisen.* (Pigment Producing Yeasts. A new Biologic Reaction with Iron.) M. W. BÄYERINCK. Arch. Neerland. Physiol., 1918, 2, 609.

Certain lactase producing yeasts develop a colorless chromogen which in the presence of iron salts and oxygen becomes red. The pigment forms colorless compounds with strong bases. The color is again restored upon the addition of acids. The pigment does not belong with the anthocyanins or carotins.—R. E. B.

1958. *Zur Kenntnis der Eiweisskörper der Fäulnisbakterien.* (The Proteins of the Decay Producing Bacteria.) E. SALKOWSKI. Hoppe-seyler's Ztschr. f. physiol. Chem., Strassb., 1920, 109, 49-57.

Bacteria producing decomposition of gelatin were precipitated by means of alcohol, and dried. This material was studied with reference to its protein characteristics. Two kinds of protein bodies were found in these putrefactive bacteria, one resembling an albumose and the other globulin-like. The tryptophane group apparently was absent in both. The xanthoproteic test was almost negative with the former, and faint with the latter. Sulphur could be recognized in both by use of Siegfried's test. Attention is called to the apparent importance of microorganisms in protein synthesis in the alimentary tracts of ruminants.—R. E. B.

## PHYSICAL CHEMISTRY

1959. *A Spectrophotometric Study of the "Salt Effects" of Phosphates upon the Color of Phenolphthalein Salts and Some Biological Applications.* CHARLES L. BRIGHTMAN, M. R. MEACHAM AND S. F. ACREE. J. Bact., Balt., 1920, 5, 169-180.

Workers are familiar with the fact that hydrogen ion concentration indicated colorimetrically in the presence of certain salts may be considerably different from the true hydrogen ion concentration as measured by the electrometric method. Data presented here demonstrate that increasing concentrations of phosphates produce increasing differences between

the hydrogen ion concentration indicated by the hydrogen electrode readings and by the colors of phenolsulfonphthalein. The spectrophotometric method used in the determination of the ionization constant of the indicator is complicated and is only briefly described. The "salt effects" of phosphates and the "corrections" are both small and from the table presented it is possible to determine the correction which is to be applied to the readings of hydrogen-ion concentrations determined colorimetrically (with phenolsulfonphthalein) in going from one salt concentration to another. Below concentrations of 0.05 M the "salt effect" becomes small. When uncorrected for "salt effect" the apparent ionization constant of the phenolic group of the phenolsulfonphthalein varies with the concentration of the phosphate present and averages about  $2.65 \times 10^{-8}$ . Freed from "salt effects" of phosphates the value is about  $1.95 \times 10^{-8}$ . The importance of stating the concentrations of chemicals or buffers when describing the tolerance of organisms to ions or molecules is indicated by these studies.—I. S. F.

1900. *Die kolloidchemische Bedeutung des physiologischen Ionenantagonismus und der Äquilibrierten Salzlösungen.* (*The Colloid Chemical Significance of Physiologic Ion Antagonism and of Equilibrated Salt Solutions.*) S. M. NEUSCHLOSZ. Arch. f. d. ges. Physiol., 1920, 181, 17-39.

The chlorides of the cations Na, K, Ca, Mg and Al increase substantially the surface tension of aqueous solutions of lecithin. The surface tension in solutions of these salts increases with increasing concentrations to a maximum at  $\frac{1}{16}$ ,  $\frac{1}{8}$ , or  $\frac{1}{4}$  molar. From this maximum the surface tension gradually decreases.

In mixtures of these salts a definite antagonism is to be observed in the action of the cations on the surface tensions of the lecithin solution. This surface tension is predominantly, if not exclusively determined by the relative concentration, and is independent of the absolute concentration within wide limits.

There is a marked parallelism between the ion antagonism as noted here and physiologic ion antagonism.

The physicochemical basis of the ion antagonism is to be sought in the ability of the cations to suppress reciprocally adsorption (in this case on the surface of the lecithin particles) without the suppressing ion supplanting the suppressed ion.

In combinations of sodium and potassium, a completely reciprocal inhibition of the action of both cations on the surface tension of lecithin solutions was found in the concentration of proportions of 1 Na:  $\frac{1}{16}$  K and  $\frac{1}{16}$  Na: 1 K.—R. E. B.

1901. *Über die Bedeutung des Ionenantagonismus für die Hämolyse.* (*On the Significance of Ion Antagonism in Hemolysis.*) S. M. NEUSCHLOSZ. Arch. f. ges. Physiol., 1920, 181, 40-44.

Chlorides of sodium, potassium and calcium inhibit each other in their hemolytic action. For each pair of salts, there is an optimal relationship in which the reciprocal antagonism is at the maximum.

The maximal antagonism is always to be found in that relative concentration of the salts which likewise show maximal antagonism to the dispersing of a lecithin solution. Similarly maximum inhibition of hemolysis of red blood cells is to be found in the combination either of 1 NaCl:  $\frac{1}{16}$  KCl and  $\frac{1}{16}$  NaCl: 1 KCl.—R. E. B.

## BACTERIOLOGICAL TECHNIC

(See also Number 2198)

1902. *A New Culture Method for the Gonococcus. Report of Experimental Studies.* E. O. SWARTZ. J. Urol., Balt., 1920, 4, 325-346.

A review is given of cultural conditions previously found necessary for the favorable growth of the gonococcus, including temperature, oxygen tension, composition and reaction of medium. A description is given of a new method devised for obtaining reduced oxygen tension by corking the tubes after heating to remove approximately 10 per cent of the air. A moist medium rich in human proteid gave profuse growths with a reaction varying between pH 6.6 and pH 8.0 under partial oxygen tension.—R. D. H.

1903. *The Isolation of the Single Bacterial Cell.* NATHAN MUTT. J. Roy. Micr. Soc., Lond., 1919, part III, 221-224.

An emulsion of the organisms to be isolated may be secured from growth on a solid medium 6 to 8 hours old. For this purpose, sterile broth or normal salt solution should be used. Narrow rings of filter paper are cut by means of cork bores and one or two placed in a hanging drop cell moistened with saline. The rim of the cell is prepared with vaseline. A perfectly clean cover slip is flamed, a minute drop of a diameter not greater than 0.5 to 0.75 mm. of the emulsion is placed on the cover slip by a very small loop in platinum wire. This is immediately placed in position over the moist chamber. The drop is searched with one-sixth dry and one-twelfth oil immersion objectives. A series of drops must be prepared and examined and the dilution of the original emulsion gradually adjusted until a drop can be found which contains a single organism. The cover glass is then raised by means of forceps, a large drop of liquefied nutrient agar, blood agar or other suitable medium placed close to the

original drop and the slip moved about until the two drops unite. This is then placed on another moist cell, kept for 24 hours, and examined for growth. If the drop contains more than one bacterium the separate colonies will be observed. Transfers may now be made from the agar on the cover glass to suitable culture media.—R. E. B.

1964. *The Use of Gentian Violet as a Restrainer in the Isolation of the Pathogenic Molds.* D. L. FARLEY. Arch. Dermat. & Syph., Chicago, 1920, 2, 459-463.

The selective action of gentian violet of 1:500,000 in solid maltose (Sabouraud's proof) mediums was found to be of value in the isolation of pathogenic molds. The epidermophytons, achorions, microsporons, trichophytons, sporotricha and actinomyces were more resistant to gentian violet than the ordinary Gram-positive bacteria.—R. D. H.

1965. *A Modification of Loeffler's Flagella Stain.* IVAN V. SHUNK. J. Bact., Balt., 1920, 5, 181-187.

"This process has given very good results in the hands of students who are doing only their third laboratory period's work on staining of any kind. Most of the class are able to get flagella in their first attempt, without any previous experience in flagella staining at all. I have found it possible by shortening the time of allowing the mordant and stain to act, to demonstrate flagella, mounted in balsam, in a little less than five minutes from the time the bacteria were placed on the cover glass." The method demands special care in the cleaning of slides and cover glasses. A ferric chloride-tannic acid mordant with aniline oil in alcohol is used preliminary to staining. The author expresses preference for a methylene blue stain. A simple modified technique is described to stain the flagella differently from the cell wall. The chief advantages which are cited for the method are: its simplicity, the use of solutions that keep well, the use of all solutions at room temperature and the high percentage of successful attempts, even in experienced hands.—I. S. F.

1966. *Zur Färbung der Guarneri'schen Körperschen. (Staining of the Guarneri Bodies.)* W. BÖING. Berl. klin. Wehnschr., 1920, 57, 299-302.

The staining technic is given in detail. By means of this technic a certain analysis of the Guarneri bodies is possible. This stain also permits the demonstration in cell nuclei of structures which appear to be specific for vaccinia infection in the cornea of the rabbit, and which are identical with the granules in the Guarneri bodies in their microscopic and staining properties.—B. C.

1967. *La recherche du spirochète pâle à l'ultramicroscope. (Demonstration of Treponema pallidum.)* ALEXANDRE MARMOREK. Schweiz. med. Wehnschr., 1920, No. 36, 397-399.

For the demonstration of *Treponema pallidum* in material from syphilitic lesions the author advocates the use of low power (Reichert Obj. No. 5-Oc. No. 4) of the microscope. With this magnification the picture presented by *Treponema pallidum* is sufficiently characteristic to permit differentiation from *Sp. refringens* or other spirilla.—G. H. S.

1968. *Eine empfehlenswerte Methode für Spirochätenfärbungen. (A Commendable Method for Staining Spirochetes.)* WALTHER KRANTZ. Deutsche med. Wehnschr., Berl. & Leips., 1920, 46, 913.

A discussion of slight modifications of the Fontana method in which carbol fuchsin or methyl violet is used.—B. C.

1969. *Einiges über die Prinzipien und neuere Methoden des Spirochätennachweises im Gewebe mit besonderer Berücksichtigung des Zentralnervensystems. (The Principles and Recent Methods of Demonstrating Spirochetes in Tissue with Special Reference to the Central Nervous System.)* F. JAHNEL. München. med. Wehnschr., 1920, 67, 932-933.

The use of water in the old Levaditi technic is a source of uncertainty in producing a satisfactory stain. Pyridin has been found to be a good substitute. Jahnel describes his pyridin-uranium method for details of which the original should be consulted.—B. C.

1970. *Bouillon Cubes as a Substitute for Beef Extract or Meat in Nutrient Media.* ZAE NORTH-RUP WYANT. J. Bact., Balt., 1920, 5, 189-190.

Media made up with ordinary bouillon cubes have been found wholly satisfactory for the carrying of all stock cultures—pathogens and saprophytes. One or one and one-half cubes (3 or 5 grams) are used per liter of medium at a much decreased cost. The use of bouillon cubes is recommended for general laboratory work.—I. S. F.

1971. *Untersuchungen über vereinfachte Nährbodendarstellung. (Studies on the Preparation of Simplified Culture Mediums.)* E. MARX AND W. EICHHOLZ. München. med. Wehnschr., 1920, 67, 933-934.

Tablets are prepared for the making of Drigalski's agar and of Barsikow's medium. For the former, 100 cc. nutrient agar is melted and one tablet dissolved in it. For the Barsikow medium, 2 different tablets are required, one per 100 cc. produces the base medium and the second contains the particular carbohydrate desired.—B. C.



1972. *Advantages of Solid Paraffin for Sealing Anaerobic Fluid Cultures.* L. R. THOMPSON. J. Infect. Dis., Chicago, 1920, 27, 240-244.

For anaerobic cultures, the author recommends the following technic:

Paraffin, m.p. 55°C. is heated above the melting point and delivered by a heated pipette into dry test tubes. About 0.5 cc. is placed in an ordinary half inch test tube. The tubes are plugged and sterilized in the autoclave. After sterilization, the paraffin is allowed to solidify in the bottom of the tubes.

Liquid culture medium is now added to the tubes, and the tubes sterilized in the upright position, by the fractional method. After sterilization, the tubes are rapidly cooled by immersion in cold water. The paraffin forms a solid layer 2 to 5 mm. thick at the top of the medium in the tube.

To inoculate the medium, the tube is gently warmed over a flame at the level of the paraffin plug. The plug can then be tilted by the platinum loop. After inoculation, the tube is again warmed at the level of the paraffin, to seal the plug, and is cooled by immersion in cold water.

By cultural tests with anaerobic organisms and by observing the gradual oxidation of leuco-bases to their colored compounds, the author shows that the plug of solid paraffin excludes oxygen from the medium for two weeks or more.—S. B-J.

### INDUSTRIAL BACTERIOLOGY

1973. *Corn Stover Silage Investigations.* J. M. SHERMAN AND S. I. BECHDEL. Penn. State College, Rpt. for 1916-17, 1919, 348-359.

This paper includes a discussion of the nature of silage fermentation in which the cell respiration theory of Babcock and Russell is contrasted with theory of fermentation by aciduric bacilli in which the conclusion is reached that the data thus far published are inconclusive. Although the results obtained in the investigation tended to support the cell respiration theory, positive conclusions on this point are withheld.—R. S. B.

1974. *Insure Desirable Fermentation in Your Silage.* ZAE NORTHRUP WYANT. Mich. Agr. Coll. Quart. Bull., East Lansing, 1920, 3, 8-9.

A brief report on procedures likely to influence the fermentation of silage favorably including some observations upon the effect of adding salt as the silos are filled.—R. S. B.

### FERMENTATION INDUSTRIES

1975. *Beiträge zur Naturegeschichte der alkoholischen Gärung. I. Über das allgemeinere Vorkommen von Hefe und Alkohol in der Natur. (Contributions to the Natural History of Alcoholic Fermentation. I. The Common Presence of Yeast and Alcohol in Nature.)* PAUL LINDNER. Wehnschr. f. Brau., 1920, 37, 1-10.

The article discusses the general distribution of yeasts in nature. The conclusion is drawn that wherever yeast occurs there alcohol is ordinarily being produced. It is concluded that even in past geological epochs alcoholic fermentation occurred. It is noted that the body produces small quantities of alcohol. The presence of certain species of yeast in the sap flowing from forest trees has led to some discussion in the literature of the so-called "beer brewing" trees. It is noted that there are certain forms of animal life which evidently require or prefer alcohol for their nourishment, particularly among the insects. Squirrels also are said to make use of such "wild" alcoholic beverages. Certain animals, particularly insects, possess body organs in which yeast grows regularly. Yeasts furthermore are widespread in the nectars of various flowers. Note is also made of the usefulness of yeasts themselves as food. The whole article is essentially an argument that since alcohol is produced in nature and utilized by insects and animals, it is also valuable for man. Finally the author takes occasion to bemoan the triumph of the anti-alcoholic laws in America.—R. E. B.

1976. *Das Biosproblem in der Hefeforschung. (The Bios Problem in Yeast Investigation.)* P. LINDNER. Deutsche Essigindust., Berl., 1920, 24, 103-105; Wehnschr. f. Brau., 1920, 37, 75.

The author gives a summary of European work on the subject of the influence of the so-called bios (on our more recent nomenclature, perhaps vitamine) on the growth of yeast. The fundamental problem is whether or not a single yeast cell can be caused to multiply or grow in a nutrient solution containing sugar and mineral salts only.—R. E. B.

1977. *Altes und Neues über die Riesenkolonien der Saccharomyceten, Mycoderma-Arten und Torulaceen. (Old and New Facts Concerning the Giant Colonies of the Saccharomycetes, the Species of Mycoderma and the Torulaceae.)* H. WILL. Ztschr. f. d. ges. Brau., 1920, 43, 163-165.

The term giant colony is used to designate the growth secured by placing a single drop containing a large number of living cells on the surface of a solid medium. Contrasted with these are small colonies secured from the development of single cells. The giant colonies are of considerable significance in the study of budding fungi. The author records results secured in a study of the best known species of *Saccharomyces*, *Pichia*, *Willia*, *Mycoderma* and *Torula*.

Giant colonies may be observed also in or on liquid media. The membrane formation on nutrient liquids corresponds to the growth on solid media. Descriptions are given of the differences in the giant colonies of the genera noted above.—R. E. B.

1978. *Eine neue Torulaart, welche in Jungbier Trübung verursacht.* (A New Species of *Torula* which Produces Clouding in Young Beer.) H. WILL AND F. O. LANDTBLOM. *Ztschr. Ges. Brauw.*, Munich, 1919, **42**, 367.

As a result of the diminution of the concentration of the worts used in manufacture of beer in consequence of the war, clouding was frequently noted in young beer as a result of the growth of torulae. The differential characteristics of a new species, *Mycotorula turbidans* Will are noted.—R. E. B.

1979. *Über eine eigenartige Herstellung von Hausessig.* (An Acetic Method for the Preparation of Vinegar in the Home.) WÜSTENFELD. *Deutsche Essigindust.*, Berl., 1920, **24**, 77-78.

The author describes the characteristic of a jelly-like material which had been handed down in one household for 30 years for the preparation of vinegar in the home. It is known as the "vinegar plant." It came originally from Brazil causing acid production in the molasses waste of the sugar manufactories. The author found the vinegar plant to be a symbiotic mixture of *Bacterium* (*Acetobacter*) *xylinum*, and a yeast. A report is given of laboratory tests as to the ability of the yeast to produce alcohol and of the bacteria to produce acetic acid.—R. E. B.

1980. *Die Bakterien im Wein und Obstwein und die dadurch verursachten Veränderungen.* (The Bacteria in Wine and Cider and the Changes Caused by Them.) H. MÜLLER THURGAU AND A. OSTWALDER. *Landw. J. Schw.*, 1916, **30**, 55.

A general study of the organisms present in wine and cider with a detailed description of a few of the more common rods and coccus forms. Their physiological reactions are noted and their by-products are correlated with the appearance of various chemical changes in wines of different ages and compositions.—G. J. H.

1981. *Neue Wege zur Bestimmung der Azidität in Würzen, Bieren und anderen physiologischen Flüssigkeiten.* a. *Untersuchungen an Lösungen bekannter Zusammensetzung mit Benutzung kapillaraktiver Fettsäuren als Indikator.* (New Methods for the Estimation of Acidity in Worts, Beers and other Physiological Fluids. a. *Studies on Solutions of Known Composition by Use of Capillary Active Fatty Acids as Indicators.*) W. WINDISCH, DIETRICH AND BEERMAN. *Jahres. d. Vers. u. Lehranstalt. f. Brau.*, in Berl., 1918-19. I. *Technischwissenschaft.* Abt. (*Ztschr. f. d. ges. Brauw.*, 1920, **43**, 61.)

The authors used as indicators substances which indicated acidities and alkalinities of solutions not by color changes, but by physical characteristics, especially through changes in the surface tension. Fatty acids, particularly undecylic acid, were found to be especially useful. Further studies are reported on the influence of substances which modify surface tension upon fermentation and the life of yeasts. It is emphasized that the addition of small amounts of substances producing considerable changes in surface tension may be quite as significant as osmotic pressure.—R. E. B.

1982. *Untersuchungen über Säurewirkung und Bildung löslicher Stärke bei Schimmelpilzen.* (Studies on Acid Action and the Formation of Soluble Starch by Molds (*Aspergillus niger*.) BOAS-WEIHENSTEPHAN. *Ztschr. f. d. ges. Brauw.*, 1920, **43**, 114.

The mold, *Aspergillus niger*, when grown in solutions having the correct acidity containing certain sugars as sucrose or levulose, polyatomic alcohols as mannitol, or citric, malic or tartaric acids, produces soluble starch. The characteristic iodine reaction may be secured in such solutions.—R. E. B.

1983. *Die Vermehrungsgeschwindigkeit der Hefen bei verschiedener Azidität.* (Rate of Multiplication of Yeasts in Different Acidities.) OLOF SVANBERG. *Ztschr. f. tech. Biol.*, Leipz., 1920, **8**, 1-22.

A study was made by the author of the acidity relationships of 5 different yeasts growing in wort, the acidity being measured electrometrically. In all of the yeasts studied, acid formation was much greater than could be explained through the development of carbon dioxide, that is, it was greater than pH = 5. The maximum measured acidities for the various organisms, using a wort, with an initial pH = 5.6 were: for a top yeast SB, pH = 2.87; bottom yeast H pH = 3.98; for a torula, 3.17, for *Saccharomyces validus*, 3.56 and *S. thermantionum*, 4.17. However no relationship could be detected between the acid production and acidity tolerance of the growth.

The optimum conditions for growth in wort for top yeast SB were between pH = 3 and pH = 6, for the bottom yeast H, between pH = 4 and pH = 6. The latter limit also served for *S. validus* and *S. thermantionum*. The torula showed good growth between pH = 2.5 and pH = 6. The same pH relationship were to be observed when the yeasts were cultivated in mineral nutrient solutions as in beer wort.—R. E. B.

1984. *Industrielle Entwicklung der Fabrikation von Essigsäure und Azeton.* (Industrial Development of Manufacture of Acetic Acid and Acetone.) G. SEMERAU. Deutsche Essig-indust., Berl., 1920, 24, 121-124.

Essentially a free translation of a paper appearing in "Chemical and Metallurgical Engineering" September 25, 1918.—R. E. B.

1985. *Über die Einwirkung oberflächenaktiver Nonylsäure und einiger oberflächenaktiver höherer Homologe der Alkoholreihe (Amylalkohol und Oktylalkohol) auf die Hefezelle und die Gärung.* (The Action of Nonylic Acid and Other Higher Homologues of the Alcohol Series (Amyl alcohol and Octyl alcohol) Which Markedly Alter Surface Tension on Yeast Cells and Fermentation.) WILHELM WINDESCH, WILHELM HENNEBERG AND WALTHER DIETRICH. Wehnschr. Brau., Berl., 1920, 37, 303-305.

Nonylic acid in increasing amounts from 0.005 to 0.02 per cent exhibits first an accelerating and then a depressant action. Larger amounts cause the appearance of many dead or moribund cells. Abnormalities in shape and fat formation also appear. Octylalcohol in amounts varying from 0.017 to 0.04 per cent show analogous reactions. Smaller amounts produce changes in the yeast morphology. The studies indicate that the action of these substances is due to changes which they induce in surface tension rather than to direct chemical action.—R. E. B.

### MYCOLOGY

(See also Number 2810)

1986. *Die Zellgröße und Zellform der untergärigen Bierhefearasse "U" unter verschiedenen Züchtungsbedingungen.* (The Size and Form of Cells of the Bottom Yeast Race "U" under Different Conditions of Growth.) W. HENNEBERG. Wehnschr. f. Brau., 1920, 27, 91-94; 111-114; 125-128; 132-135.

As a result of the study of the growth forms of this organism under various conditions, the following conclusions are reached:

1. Spherical cell forms, in so far as they are not racial characters, generally indicate influences tending to inhibit growth more or less. They are particularly evident when the yeasts are kept at too high a temperature, for example at 33°; when they are kept in a cold place; when there is lack of sufficient food or lack of air, and they develop also upon the addition of poisonous substances including an excess of alcohol.

2. Elongated cells are the characteristic normal forms and are to be found under more natural conditions. The seeding of very small numbers of yeast into wort influences multiplication unfavorably.

3. Under ordinary conditions cells do not often reach their maximum size.

4. Parent cells are, for the most part, large cells which as a result of numerous budding, no longer show a regular cell form.

5. Young cells are, for the most part, small cells usually about 5.5 $\mu$  long, which are not yet multiplying.

6. The presence of numerous young cells often indicates hunger, it is therefore an unfavorable sign in compressed yeast.

7. Variations in size of the yeast cell is the rule; cells of uniform size are accidental.

8. Cells which occur with unusual amounts of glycogen and which usually have a definite form and size are pathologic.—R. E. B.

1987. *Canvas Destroying Fungi.* J. RAMSBOTTOM. Nature, 1920, 105, 563-564.

Army tents were frequently found to have "diamond spot," i.e., many dark brown and black spots often more or less diamond shaped. Investigation showed that the principal agents of destruction of cotton- and flax-made canvas are *Macrosporium* and *Stemphylium*. The latter is the more prevalent in Malta. The variation in color is due to the growth of other fungi in association with the above genera, some of which are yeasts and bacteria. These fungi may assist in the destruction but in every case one of the first named genera was present. Perforation or tearing of the canvas often resulted within 3 months. New canvas of cotton and of flax was examined. Mycelium was found only among the fibers of canvas made from flax, which is not surprising when the methods of preparing the two fibers are taken into consideration. Both canvases may be infected, however, after being made up. Ordinarily, "cutching" treating with the product of acacia, or with sodium chromate, and the Willesden (cuprammonium) method prevented the growth of the fungi. A 1:5000 solution of soft soap followed by a 1 per cent mixture of alum and  $\text{CuSO}_4$  was successful at Malta in checking the growth of these fungi.—Z. N. W.

### SOIL BACTERIOLOGY

1988. *The Antagonistic Action of Calcium and Iron Salts toward Other Salts as Measured by Ammonification and Nitrification.* J. E. GREAVES. Soil Sc., Balt., 1920, 10, 77-102.

The soil used in these experiments was a productive sandy loam from Logan, Utah, very high in acid-soluble constituents but without excessive water-soluble constituents. It was found that a true antagonism exists between  $\text{CaSO}_4$  and  $\text{Na}_2\text{CO}_3$ ,  $\text{NaNO}_3$ ,  $\text{Na}_2\text{SO}_4$ ,  $\text{CaCl}_2$ ,  $\text{MgCl}_2$  and  $\text{MgSO}_4$ , as measured in terms of ammonification and to a lesser extent of nitrifica-

tion. This is greatest with  $\text{Na}_2\text{CO}_3$  and does not occur with  $\text{NaCl}$ . The beneficial effects of  $\text{CaSO}_4$  in the presence of  $\text{Na}_2\text{CO}_3$ , is considered by this author to be due to the chemical changing of  $\text{Na}_2\text{CO}_3$  into  $\text{Na}_2\text{SO}_4$  and  $\text{CaCO}_3$ , together with a direct antagonistic action contrary to the results of Lipman, but in accordance with Brooks. Greaves confirms Lipman's contention that anions as well as cations take a part in antagonism.

Iron salts applied to soils change the physical, chemical and biological nature of the latter as well as exerting true antitoxic action toward some alkali salts. The quantity of iron required for maximum efficiency varied with the iron compound used and the specific alkali, but did not exceed 186 parts per million. The possible use of these salts in the reclamation of alkali soils is indicated.

Antagonism is usually greater between monovalent and bivalent ions than between two bivalent ions. Details of antagonism found with all the salts previously mentioned are given as measured by ammonification and nitrification.—N. K.

1989. *Influence of Moisture on the Bacterial Activities of the Soil.* J. E. GREAVES AND D. G. CARTER. Soil Sc., Balt., 1920, 10, 361-387.

The influence of water upon the bacterial activities of 22 soils representing different typical farming lands of the Cache Valley were studied. The equations for correlations between moisture-equivalent, wilting point and hygroscopic coefficient are indicated for ammonification, nitrification and nitrogen fixation.—N. K.

1990. *The Oxidizing Power of Soil From Limed and Unlimed Plots and Its Relation to Other Factors.* J. R. NELLER. Soil Sc., Balt., 1920, 10, 29-40.

Fresh soils from the surface 6 inches of four  $\frac{1}{4}$ -acre fertility plots at the New Jersey Agricultural Experiment Station, were tested for their oxidizing, nitrifying, ammonifying and azoifying powers. The oxidizing power of the soil from the limed plots was approximately 40 per cent greater than that from the unlimed. In the soil type (sassafras loam) the oxidizing power varies with its lime requirement. Nitrate accumulation and bacterial numbers were higher on the limed soils, whereas the ammonia accumulation was about the same for all of the plots.

The average crop yield for the past ten years varies closely with the present oxidizing power of the soils. There is also a noticeable correlation between crop yield, nitrate accumulation and bacterial numbers, but not between crop yield and ammonia accumulation.—N. K.

1991. *The Relation of Nitrates to Nodule Production.* W. H. STROUD. Soil. Sc., Balt., 1920, 10, 343-356.

When soybeans were grown in soil or in sand containing nitrates there was a marked accumulation of nitrates in the plant. This was greater in concentration in the plant sap than in the surrounding medium. There was an increase in the nitrate content of the roots during the period of arrested photosynthesis. The nitrate content of sap increased to some extent with the nitrates in sand, although this increase was not directly proportional. Nitrates had little effect on the hydrogen-ion concentration of the plant juice.

The concentration of nitrates present in the plant sap when the plants failed to produce nodules is sufficient to prevent the growth and reproduction of soybean bacteria in soil. On the other hand, the concentration of the nitrates in the soil in which the plants were grown was so low that growth and reproduction of the bacteria in the soil was stimulated. This suggests that the reason for failure of nodule production in presence of nitrates is due at least in part to the effect of high concentration of nitrate in the sap. This theory of the direct influence of high concentrations of nitrates in plant sap on *Rhizobium leguminosarum* is out of harmony with Wilson's findings that the inhibiting factor is local in character. The amount of reducing sugar in plants decreased with the increase in nitrates. Some evidence indicates that the deleterious effect of the high nitrate concentration upon reducing sugar is at least partially of a specific nature.—N. K.

1992. *Nitrification in Texas Soils.* G. S. FRAPS. Texas Agric. Exper. Sta., Bull. 259, 1920, 5-37.

The average quantity of nitrates produced increases with the total nitrogen of the soil; that is, the nitrification is proportional to the total nitrogen. Except in soils containing less than 0.02 per cent nitrogen the percentage of organic nitrogen converted to nitrate is quite constant.

Wide variations were found in the amounts of nitrates produced by individual Texas soils; some of the soils did not nitrify, while others had an unusually high nitrification. Acid soils on an average showed less vigorous nitrification than non-acid soils; but some acid soils showed very high nitrification, while others were very low or did not nitrify at all. Calcium carbonate increased nitrification; phosphates and potash also had a stimulating effect on some soils, the phosphate being more effective than the potash.—J. M. S.

1993. *Nitrate Production in Soil as Affected by the Crop and Cultivation.* WILLIAM A. ALBRECHT. Missouri Agric. Exper. Sta., Bull. 163, 1919, 67-68.

Nitrate determinations made on the surface soils of 10 plots under different systems of cropping and cultivation show that the most significant influence of the crop is that of removing the nitrates, and that reduction of nitrates takes place when the crop makes a rapid growth.

Plots left uncultivated were found to be higher in nitrate than those cultivated regularly during the year, which indicates that cultivation has little effect in bringing about an accumulation of nitrate. Straw mulch had a decidedly depressing effect on nitrate accumulation, owing apparently to high moisture content. (Chem. Abstracts.)—J. M. S.

1994. *Behavior of Inoculated Leguminous Seeds.* ETHELBERG JOHNSON. Month. Bull. Depart. Agric., State of Calif., Sacramento, 1920, 9, 31-36.

A discussion of some of the more commonly asked questions regarding the use of commercial cultures for inoculating leguminous plants. The possibilities of cross inoculation, comparative value of laboratory grown strains as against those which may be present naturally in the soil, effect of acid and alkali, viability of the organisms under various soil conditions are the main features considered.—T. D. B.

1995. *Directions for the Inoculation of Bean Seed, Applicable to other Legumes.* CHARLES B. LIPMAN. Month. Bull. Depart. Agric., State of Calif., Sacramento, 1910, 9, 36-37.

A soil culture of *B. radiculicola* may be prepared by placing in a barrel approximately 150 pounds of good loam soil. A commercial culture of the legume inoculating organism is then shaken up thoroughly with water previously boiled and cooled and this resulting suspension is added to the soil. Sugar at the rate of one quarter pound per 100 pounds of the soil is then added and mixed in carefully. The barrel of material is kept fairly warm in a stable and water is added occasionally. After a few weeks the soil thus prepared may be used directly as an inoculating culture.—T. D. B.

## PLANT PATHOLOGY

1996. *Some Insect Relations of Bacillus tracheiphilus Erw. Sm.* FREDERICK V. RAND AND LILLIAN C. CACK. Phytopath., 1920, 10, 133-140.

The authors continued the studies on insect transmission of bacterial wilt of cucurbits started by Rand and Enlows and found that the pathogen was harbored over winter by the striped cucumber beetles internally. Infection of the leaves takes place through the mouth parts of the insects after feeding upon wilted plants and also when the feces of beetles come in contact with injured leaves. *Bacillus tracheiphilus* has been isolated from the viscera of the striped cucumber beetles fed with wilt-infected cucumber leaves.—F. C. W.

1997. *Bacterial Blight of Soy Bean.* FREDERICK A. WOLF. Phytopath., 1920, 10, 119-132.

Bacterial blight of soy beans has been reported from Nebraska, Connecticut, Wisconsin, and North Carolina. The author has found it to be a new organism, quite different from previously described parasitic bacteria on Leguminosae. The organism is called *Bacterium sojae*.

Infected seed seems to be the chief source of carrying the disease over winter, and infection seems to spread from the cotyledons to the first true leaves and from there to other leaves. Water is one of the chief agents in distributing the pathogen from one part of the plant to another. So far no distinct difference in susceptibility of varieties of soy beans has been noticed by the author.—F. C. W.

1998. *The Behavior of Crown-Gall on the Rubber Tree.* M. LEVINE. Proc. Soc. Exper. Biol. & Med., N. Y., 1920, 17, 157.

This plant was chosen because the experiments could be continued throughout the year. Injection of the *Bacterium tumefaciens* stimulates the production of benign or malignant neoplasms. When the plant is killed, its death is suggestive of that brought about in animal cancer.—W. H. W.

1999. *Gumming Disease of Sugar Cane in Porto Rico.* J. MATZ. Phytopath., 1920, 10, 429-430.

The author found gumming disease of sugar cane present in two car loads of cane from the Trujillo Alto district, Porto Rico. Cultures were made from the gum and compared with those of *Bacterium vacuolarum*. They were found to be identical. The pathogenicity of the organism was tested and found to be able to bring about gumming of sugar cane.—F. C. W.

2000. *A Bacterial Leafspot or Velvet Bean.* FREDERICK A. WOLF. Phytopath., 1920, 10, 73-80.

During the summer of 1916, a leafspot of Florida velvet bean was noted by the author in the vicinity of West Raleigh, N. C. It was found that the disease was caused by a hitherto undescribed pathogen which was named *Aplanobacter stizolobii* n. sp. This organism is quite distinct from the organism causing a bacterial blight of soy bean, known as *Bacterium sojae*. Infection of the leaves takes place through the stomata and apparently only parenchyma tissues are attacked by the organism.—F. C. W.

2001. *The Effect of Certain Environmental Conditions on the Rate of Destruction of Vanillin by a Soil Bacterium.* W. J. ROBBINS AND A. B. MASSEY. Soil Sc., Balt., 1920, 10, 237-246.

One of the theories to explain why soils are infertile is the soil toxin theory which assumes that the failure of crops is due to the presence of organic material in the soil which is injurious to the plants. Among the toxic compounds isolated from soil is vanillin. In some soils, how-

ever, vanillin has no toxic effect on plants, due presumably to its decomposition by bacteria. The present investigation was made with a vanillin-destroying bacterium isolated from Alabama soil.

It is believed that the number of species of soil bacteria able to destroy vanillin is limited. Slight concentrations of HCl inhibit the action on vanillin of the soil bacterium studied. Aeration favors the destruction of vanillin by the organism used. In solution cultures containing  $\text{CaH}_2(\text{PO}_4)_2$ ,  $\text{NaNO}_3$ , and  $\text{K}_2\text{SO}_4$  singly or in combination and inoculated with the bacterium used, vanillin is destroyed most rapidly in those solutions high in  $\text{CaH}_2(\text{PO}_4)_2$  and least rapidly in the solutions high in  $\text{K}_2\text{SO}_4$ . The presence of glucose has no marked effect on the rate at which vanillin is destroyed by the bacterium used.

In the light of these facts it seems probable that the reason why organic compounds are injurious to plants in some soils and not in others is that the organisms which decompose the compounds in question are lacking in some soils and in others, although present, are unable to grow because of unfavorable conditions.—H. J. C.

**2002. Cross Inoculation Studies with the Nodule Bacteria of Lima Beans, Navy Beans, Cowpeas, and Others of the Cowpea Group.** A. L. WHITING AND ROY HANSEN. *Soil Sc.*, Balt., 1920, 10, 291-300.

The nodule bacteria of the lima bean (*Phaseolus lunatus*) are distinct from those of the navy and kidney beans (*Phaseolus vulgaris*) for inoculating purposes. The nodule bacteria of lima beans are identical with those of the cowpea group for inoculating purposes.—N. K.

**2003. Terminal Inspection of Plant Products in the Mails.** Lee A. STRONG. *Month. Bull. Dept. Agric. State of Calif.*, Sacramento, 1920, 9, 231-245.

Without inspection of plants shipped through the mails, the efficacy of our present plant quarantine laws is nullified largely. This fault should be rectified. For this purpose, all mail shipments of plants should be routed to central points where proper inspection may be made. Active coöperation on the part of postmasters and mail officials therefore is a necessity. They should be trained both by opportunity to watch the work of inspection and by having imparted to them a few of the fundamental facts concerning plant diseases and their economic importance.—T. D. B.

**2004. Mexican Army Recognizes Plant Quarantine.** O. A. PRATT. *Month. Bull. Depart. Agric. State of Calif.*, Sacramento, 1920, 9, 363-364.

The Mexican forces about to advance into Lower California upon being informed that danger of introduction of pink boll worm or of Mexican boll worm into the Imperial Valley through the medium of their cotton clothing would arise were they to wear such articles in the region, destroyed the worn garments and were supplied by their authorities with new ones.—T. D. B.

## DAIRY BACTERIOLOGY

**2005. An Unusual Outbreak of Ropy Milk.** B. W. HAMMER AND W. A. CORDES. *J. Dairy Sci.*, Balt., 1920, 3, 291-299.

"An outbreak of ropy milk occurring in Iowa, that was unusual in the time of year it appeared, was studied and found to be due to an organism quite different than the type usually responsible for ropy milk. The organism, which was studied morphologically, culturally and bio-chemically, was closely related to *M. mucofaciens* (Thöni and Traysen) and was also somewhat like *M. Freudenreichii* (Guillebeau) but showed characters that made it seem desirable to designate it as a new species, *Staph. cremoris-viscosi*. Some time after the disappearance of the trouble, the causative organism was found in the udders of cows in the producing herd. It was impossible however to tell whether the invasion of the udders preceded or followed the outbreak of ropy milk; in either case conditions were different when the milk carefully drawn from the udders was examined than when the outbreak occurred since when the examination was made the milk was no longer developing ropiness."—R. S. B.

**2006. An Associative Study of *Strept. lacticus* and *B. subtilis* in milk.** MAX S. MARSHALL. *J. Dairy Sci.*, Balt., 1920, 3, 406-413.

Sterile litmus milk in 100 cc. flasks was inoculated with varying quantities of milk cultures of the two organisms, the unit of measurement being drops from Roux pipettes. The fermentation reactions were studied by titration, and observation of the effect on litmus and curdling. The best counts that could be obtained were made by the plating method, but are reported to have been made with difficulty. No attempt was made to use the microscopic methods found so successful by Baker, Brew and Conn under similar circumstances (see abstract in this Journal, Vol. 4, No. 1578).

It was concluded that: (1) the presence of *B. subtilis* in milk influences lactic fermentation; (2) the higher the concentration of *B. subtilis* in the original milk the greater the stimulus in the earlier stages of fermentation; (3) the "optimum" ratio of *B. subtilis* to *Strept. lacticus* in the original milk which will give the greater stimulus in the later stages of fermentation is very small—approximately 22 to 10,000; (4) the stimulus is more evident at low temperatures than at high; (5) association plays an undeterminable part in the differences in lactic fermentation caused by clarification.—R. S. B.

2007. *The Relative Value of the Methylene Blue Reduction Test, the Brom Thymol Blue Test, and the Brom Cresol Purple Test in Determining the Keeping Quality of Milk.* E. G. HASTINGS AND AUDREY DAVENPORT. *J. Dairy Sci., Balt.*, 1920, 3, 353-366.

A comparison of two recently proposed biochemical tests for determining the sanitary quality of milk (see this Journal, Vol. 4, Abs. 19 and 602) with the well-known reductase test. The authors summarize their conclusions as follows: "In a comparison of the three tests, methylene blue reduction, brom thymol blue, and brom cresol purple for the determination of the keeping quality of milk, it is shown that the methylene blue reduction test is the preferable because of its greater sensitiveness to biological differences in milks; because it measures the number of bacteria rather than the by-products of their growth; and because of its simplicity and practicable advantages."—R. S. B.

2008. *Commission on Milk Standards. Report of the National Commission on Milk Standards of the New York Milk Committee, 1920.* Pub. Health Rep., Wash., 1920, 35, 2955-2958.

The subjects on which resolutions were unanimously passed and released for publication include pasteurization, scurvy, infected udders, service bureau, good milk and the school lunch movement, dried milks.—I. A. B.

2009. *Experiments with and Practical Application of Heat Sterilization for All Parts of Milking Machines.* G. H. HART AND W. H. STABLER. *J. Dairy Sci., Balt.*, 1920, 3, 33-51.

A study of the efficiency of heat sterilization as a means of keeping the bacterial content of machine drawn milk within reasonable limits. The work was largely done on three California farms, one producing a "guaranteed" milk, another "certified" milk and the third, ordinary market milk for San Francisco Bay cities. The machines in use were of the Sharples, Empire and Perfection types. The method of sterilization used was to suck 3 to 4 gallons of water through each machine immediately after milking. Then to take apart and scrub the teat cup parts, after which they were placed in a galvanized iron tank containing sufficient water to cover the parts. The water in the tank was then heated with steam to a temperature of 160° to 180° F. Sometimes the tubes were removed after the heating, while at other times they were left in the water which gradually cooled until the next milking time. The latter process is regarded as preferable.

Counts were made by rinsing sterile water through the parts and also from the milk drawn through the pails. On the two high grade dairies, the counts were ordinarily less than 10,000. On the market milk farm, the counts which had been in the millions with an inefficient system of chemical sterilization, were reduced to the hundred thousands by heat sterilization. No comparative data on the effects of chemical sterilization are given; but the authors reach the conclusion that heat sterilization is the only way to successfully sterilize milking machine parts. Only general statements are given to support this conclusion.—R. S. B.

2010. *Einfluss des Melker mit der Melkmachine "Omega" auf die bakteriologische Beschaffenheit der Milch. (Influence of Milking with an "Omega" Milking Machine on the Bacteriological Content of the Milk.)* R. Burri and F. HOHL. *Landw. Jahrb., Schweiz.*, 1916, 30, 240.

A detailed comparison of the bacterial content of milk drawn by hand and with a milking machine (Omega). Qualitative and total count studies were made. Various amounts of the milk were inoculated into lactose broth to determine the presence of gas producers.

Milk drawn by a machine, only roughly cleaned at the barn, showed a count of 15,000 to 400,000 per cc. with 45 samples indicating gas and 3 samples showing no gas.

Machines not cleaned drew milk containing from 720,000 to 13,000,000 with gas produced in all cases. Warm water with soda cleaning solution lowered the count to below 200,000 while steam sterilization resulted in a count below 4000 with no gas formers in any dilution. Milk drawn by hand under similar conditions had a count of 1000 to 31,000 per cc. and only 4 of 48 samples showed lactose fermenters.—G. J. H.

2011. *The Use of Fermented Milk and Milk Diets in Controlling Intestinal Putrefaction.* R. C. FISHER. *J. Dairy Sci., Balt.*, 1920, 3, 414-424.

The author reports the results of a study of the intestinal flora, decomposition products (such as phenol, indol, skatol and indican in feces and urine) and general well being of 3 groups of 6 persons each when fed for 28 days on: (a) fermented milk containing *B. bulgaricus* and *B. lacticus*; (b) 2 to 4 quarts of milk daily of certified quality; (c) food mixed with watery suspensions of cultures of *B. acidophilus*, *B. bulgaricus*, and *B. bifidus*. The effect of feeding the fresh milk was very similar to that obtained from using the fermented milk, while very little, if any, effect was found from the use of the cultures of bacteria. With both milk diets there was a decrease in the decomposition products in the feces and urine, but patients suffering from constipation were not relieved by the milk diet as markedly as with the bulgaricus diet. There was a marked change in the intestinal flora with the milk diets, the Gram-negative colon types being replaced by the Gram-positive *Bacillus acidophilus*. Very few *B. bulgaricus* could be recovered from the intestinal flora even where large quantities of this organism were present in the diet. Organisms of the *B. acidophilus*, *B. bulgaricus* and *B. bifidus* types were not increased in number in the intestine by the use of cultures of these organisms with the food, thus supporting the idea that the change in the intestinal flora noted from the use of milk diets was largely, at least, produced by the use of the milk itself. It is suggested that the use of fermented milks prepared with *B. acidophilus* may be found even more useful than those

prepared with *B. bulgaricus*. The former organism is regarded as a natural inhabitant of the intestine, and produces a fermented milk of a pleasing, mild, acid flavor and a rich, creamy consistency.—R. S. B.

**2012. On the Destruction of Bacteria in Milk by Electricity.** J. MARTIN BEATTIE and F. C. LEWIS. Med. Research Com., Spec. Rpt. Series No. 49, Lond., 1920, 1-32.

In this paper are reported the results of a series of experiments in which milk was exposed to the action of a high voltage alternating current. The essential part of the apparatus consisted of a horizontal glass tube with 3 enlargements in which were located the electrodes. This tube was connected into the system by short pieces of aluminum tubes through which ground connections were made. Suitable arrangements were made to control the rate of flow through the machine and to read the temperature of the milk as it came from the electrodes.

In the larger of the two outfits used the milk in flowing at the rate of 30 gallons per hour was exposed to an alternating current at 3650 to 4200 volts and 2.1 to 2.3 amps. This heated the milk to between 60° and 63.5°C. Total bacteria were determined on agar at 37° and colon on neutral red agar at 37°. In a series of 15 samples in which the bacteria varied from 19,000 to 900,000 the total count was reduced to between 0 and 642 per cubic centimeter, and the colon count from between 17 and 1300 in the raw milk to none in the treated milk. *B. tuberculosis* in badly infected milk was totally destroyed if the temperature was kept between 62 and 64°. No chemical change could be found in the milk and its reaction to enzymes was unaffected. No trace of copper or other metals could be found. The authors express the opinion that the destructive action on bacteria is due to the direct action of the current and not to the heat, but they state that Sir Oliver Lodge, who supervised the work on the electrodes, disagrees with this opinion.—L. A. R.

**2013. The Production of Clean Milk.** THOMAS ORR. J. Roy. Agric. Soc. Eng., 1919, 80, 21-45.

The three principle sources of bacteria in milk are: the udder, giving an initial contamination of 1 to 6000 per cubic centimeter; the air, adding 440 to 4752 per cubic centimeter; and the utensils, contributing numbers varying with the conditions under which the milk was produced.—G. J. H.

**2014. Periodische Untersuchungen über Euterbakterien der Kühe des Lieberfelderstalles.** (Periodical Studies of the Udder Bacteria of the Cows in the Lieberfeld Stables.) R. BURRI AND L. HOHL. Landw. Jahrb., Schweiz., 1917, 31, 415-428.

In this study of the udder flora over an extended period, an attempt was made to correlate changes in flora to changes in the feed of the animals.

Variations were found from 10 to 1410 per cubic centimeter with an average of 310 per cubic centimeter. Short rods and cocci predominated with a few streptococci in some udders. The eventual rôle of each of these groups is not known; the cocci may play some part in cheese ripening.—G. J. H.

**2015. A Study of Factors Concerned in the Production of Clean Milk. Part I.** EDITH G. KNIGHT, KATHLEEN FREEAR AND R. STONEHOUSE WILLIAMS. Research Inst. in Dairying, Reading Coll., Reading, Eng., 1920, 8 pp.

A series of observations made on an ordinary English dairy farm, to show the effect of changing procedures upon the germ content of the milk, carried out with the purpose of showing the procedures essential for the production of milk with a low germ content. Sterilization of utensils is especially emphasized as a result of the work. Covered pails were found effective in keeping out dirt, and reducing the germ content provided they were sterilized properly. Removal of long hairs and washing the cows was found effective in diminishing a fruitful source of contamination.—R. S. B.

**2016. How Do Bacteria Get into Milk at the Farm and How May Their Number Be Reduced?** M. J. PRUCHA, H. A. HARDING, H. M. WEETER AND W. H. CHAMBERS. J. Dairy Sci., Balt., 1920, 3, 308-313.

A general summary of the more important investigations dealing with this subject.—R. S. B.

**2017. Clarification of Milk.** CHARLES E. MARSHALL AND E. G. HOOD. J. Dairy Sci., Balt., 1920, 3, 245-259.

This report constitutes Part II of the work previously abstracted in this Journal (Vol. 3, Abs. no. 1524; Vol. 4, Abs. no. 592) and was done at the Mass. Agr. Exp. Station. It deals primarily with the causes for the influence that clarification exerts upon microbial activities. It was found that the larger organisms like *Oidium lactis*, *B. tumescens*, etc. are thrown out to a much greater degree than *Strept. lacticus* and other small organisms. The result of this is to favor normal lactic acid fermentation in clarified milk. The indications are also that proteolysis takes place to a greater extent in unclarified than in clarified milk. Clarified milk also showed a slightly increased acidity, attributed to increased carbon dioxide content and to the lactic directive influence. The clarified milk generally reduced methylene blue more slowly than the unclarified. When samples of clarified and unclarified milk were allowed to curdle



and the curds separated by filtering through sterile filter paper, it was found that the curds from the unclarified milk tended to mold and undergo proteolysis, much more than those from the clarified milk.—R. S. B.

**#2018. *The Keeping Quality of Milk as Judged by the Colorimetric Hydrogen Ion Determination.*** L. H. COOLEGE AND R. W. WYANT. J. Dairy Sci., Balt., 1920, 3, 156-166.

A report of the results obtained by incubating neutral broth tubes containing brom-thymol-blue indicator (see this volume, Abs. No. 19) which are inoculated with 0.1 cc. of added milk. It was found that the poorer samples of milk could be picked out at the end of 1 hour, and the best samples given their grade at the end of 8 hours. It was found possible to examine upwards of 100 samples per day when the Coolege comparator was used.—R. S. B.

**#2019. *Orla-Jensen's Classification of Lactic Acid Bacteria.*** P. G. HEINEMANN. J. Dairy Sci., Balt., 1920, 3, 143-155.

An extended review and discussion of Orla-Jensen's monograph on the subject. The latter has been previously reviewed in this volume, Abs. No. 492.—R. S. B.

**#2020. *Suggestions Regarding the Control of Municipal Milk Supplies.*** H. A. HARDING AND M. J. PRUCHA. J. Dairy Sci., Balt., 1920, 3, 107-121.

The authors present the view that the milk consumer is primarily interested in the richness, safety, cleanliness and sweetness of his milk supply and urge the organization of municipal milk control so as to determine the food value, healthfulness, cleanliness and keeping quality of the milk supply. Information regarding these matters may be obtained accurately, and with a minimum of expense through an inspection of milk plants coupled with the application of simple and well established tests to bottles of milk as they are delivered to the consumer.—R. S. B.

**#2021. *Ueber Maul- und Klauenseuche beim Menschen. (Foot and Mouth Disease in Man.)*** EB. VIEL. Münch. med. Wchnschr., 1920, 67, 869-870.

Humans are infected by using uncooked milk from infected animals, or by direct contact with the lesions or secretions. Viel describes a fatal case resulting from contact with infected animals.—B. C.

**#2022. *Elimination of Germs from Dairy Utensils. 1. By Rinsing. 2. By Drying in Sun and Air.*** M. J. PRUCHA AND H. A. HARDING. Univ. Ill. Agr. Exp. Sta., 1920, Bull. 230, 139-168.

A continuation of studies previously noted (Vol. 1, Abs. No. 1533, Vol. 2, Abs. No. 712). The previous studies having shown that the largest part of the initial contamination of milk at the farm is due to the utensils rather than to the condition of the barn surroundings, the authors have in this bulletin directed their attention to a study of the effects of certain common farm practices upon the elimination of germs from dairy utensils. From the studies of the effect of using various amounts of rinse waters at various temperatures, the conclusion is reached that the use of one quart of rinse water per can at a temperature of 150° F. gives good results in the mechanical removal of germ life; but water in this amount and at this temperature has little killing effect. With the use of larger quantities of water at 150° F., or of the same amount at higher temperatures, the removal or destruction of germ life is constantly increased.

The most valuable conclusion from the studies of the effect of drying utensils in sun and air is the great importance of drying as a means of reducing the amount of germ life in the common dairy utensils. Pails and cans given such a washing as is practicable even on farms where no steam is available, will increase the count of milk placed in them less than 100 per cubic centimeter, provided these utensils are promptly and thoroughly dried. Exposure of inverted utensils, with covers off, to the heat of the sun is a satisfactory treatment. However this treatment becomes less satisfactory in rainy damp weather, and under these conditions the germ life may hold its own or even increase in amount.—R. S. B.

**#2023. *Determination of Keeping Quality of Milk.*** L. H. COOLEGE. Mich. Agr. Exp. Sta., Quart. Bull., 1920, 2, 168-169.

A brief report of results secured in the examination of samples of milk from a city milk plant by means of the brom-thymol-blue broth test previously referred to in this volume, Abs. No. 19.—R. S. B.

**#2024. *Some Characters Which Differentiate the Lactic Acid Streptococcus from Streptococci of the Pyogenes Type Occurring in Milk.*** J. M. SHERMAN AND W. R. ALBUS. Penn. State College, Rpt. for 1916-17, 1919, 360-372.

Already abstracted from another source (Vol. 1, Abs. No. 7, and Vol. 2, Abs. No. 661).—R. S. B.

**#2025. *The Development of Acidity in Milk.*** D. W. STEUART. J. Dairy Sci., Balt., 1920, 3, 52-59.

A general discussion of the complicated biological processes involved in the souring of milk with observations on the souring of samples from the Cardiff, Wales, milk supply, and

upon pasteurized milk samples. A report is made that when the starters used in Cheddar cheese making were half composed of lactic streptococci and half *B. bulgaricus*, the resulting truckle Cheddars when ripe differed in no way (neither in texture nor flavor) from control cheeses made with pure lactic streptococci starters.—R. S. B.

**2026. Development of Culture.** W. O. FROHRING. Creamery & Milk Plant Month., 1920, 9, 48-56.

A detailed account of methods for using "*Streptococcus lacticus*" starters in commercial work.

The lactic cultures used were found to grow best at 20°C., and the strength of such cultures was determined by having a "short lag phase, an ability to go through a logarithmic growth phase, and having a short generation time during the logarithmic growth phase."

The age of a culture lengthens the lag phase and after being at ice-water temperature for 9 days, the lag period is too long to permit practical uses of the culture. With specially designed apparatus and controlled temperature, etc., strong cultures may be maintained indefinitely.

The author finds that the addition of a large amount of culture to a medium does not hasten the ripening of the medium and that the least possible amount of culture should be used to prevent the accumulation of dead organisms.—G. J. H.

**2027. Fishy Flavor in Butter.** J. T. CUSICK. J. Dairy Sci., Balt., 1920, 3, 194-205.

Salted and unsalted butter was made from each of 6 portions of cream inoculated with *Bact. ichthyosmii*, Hammer (Abs. Bact., 1, Abs. No. 1544). Check samples of salted butter uninoculated with this organism were prepared from each portion. No check samples developed the fishy flavor, nor did any of the inoculated unsalted samples. Some, though not all, of the remaining salted and inoculated samples developed fishy flavor, from which it was concluded that the age of the cream, the acid content of the cream, and the period of incubation before churning seem to influence the production of fishy flavor. He concludes that decomposition products of lecithin are used as pabulum by *Bact. ichthyosmii*, and that the organism forms therefrom trimethylamine, a compound that imparts fishy flavor to the butter. (See also this volume, Abs. No. 610).—R. S. B.

**2028. A Bacteriological and Biochemical Study of Experimental Butters.** CHAS. W. BROWN, LULU M. SMITH AND G. L. A. RUEHLE. J. Dairy Sci., Balt., 1920, 3, 375-405.

A total of 3954 lbs. of 23.19 per cent cream with an acidity of 53° was divided in 4 lots and churned as follows: part I was churned at once; part II was pasteurized and churned about an hour later; part III received an addition of starter and was held over night before churning; part IV was pasteurized and after receiving a starter was held over night before churning. The butter from each churning was separated into 5 lots and given treatment as follows: (1) Salted, worked and tubbed (control); (2) washed with lactic acid, salted and tubbed; (3) 90 grams of powdered casein worked into 60 pounds of salted butter; (4) 120 grams of powdered boric acid worked into 60 pounds of salted butter; (5) one pound of fishy butter worked into 60 pounds of salted butter. After storage, samples were analyzed for total bacteria count and types of organisms present, moisture, salt, lactose, acidity and nitrogen content.

The raw cream butters quickly developed the old cream flavor which was later followed by fishy flavor, while the pasteurized (sour) cream butters early developed a metallic flavor. Tallowy flavor developed more frequently in the raw cream butters than in the pasteurized cream butters. Acid flavor developed much more frequently in well ripened pasteurized butters than in raw cream butters. From this study there is no evidence that either pasteurization or ripening improves the keeping quality of butters made from cream which has already soured. Relatively high bacterial counts were obtained from old butters, and lactic acid organisms persisted longer than usually reported. A gradual decrease was noted in lactose accompanied by an increase in acidity which was not strictly proportional. Less total nitrogen was found in the pasteurized cream butters, while a small but fairly constant amount of soluble nitrogen was found in all cases. Twelve typical butter organisms were tested in regard to their tolerance to salt, the conclusion being reached that 5 per cent salt did not retard the growth and action of the butter organisms as much as expected.—R. S. B.

**2029. A Microscopic Method of Examining Butter for Microorganisms.** G. L. A. RUEHLE. Mich. Acad. Sci., 1919, 21st Rpt., 123-125.

The author points out the need for a method of estimating the numbers of bacteria in butter microscopically, present microscopic methods being used merely to demonstrate their presence. The technique finally devised consisted in melting 1 gram of butter in a separatory funnel with 1 cc. of hot water. Then 50 or 100 cc. of ether or other fat solvent was added and thoroughly mixed with the melted butter. After standing the aqueous portion was drawn off into a graduated cylinder, and diluted with an equal amount of sterile skim milk freed from microorganisms by sedimentation. One-fiftieth of a cubic centimeter of this mixture was spread on a glass slide and dried and stained according to the Breed method for examining whole milk. The relations maintained were such that each preparation contained the organisms from 0.01 gram of the butter. Counts were made on a series of butters where the area counted was such that each organism seen in a single field of the microscope represented 650,000 organisms per gram of butter.

In the preliminary series of counts made, it was found that the microscopic counts from pasteurized butters were higher than agar plate counts. This was explained on the assumption that dead organisms were present. Where counts were made from unpasteurized cream butters, however, the microscopic counts were lower than the plate counts, the explanation for this relationship not being easily apparent. Some conditions suggest that organisms were overlooked in the microscopic preparations because of faint staining or small size. Further investigations are being made.—R. S. B.

**2030. Mottles in Butter—Their Causes and Prevention.** O. F. HUNZIKER AND D. F. HOSMAN. J. Dairy Sci., Balt., 1920, 3, 77-106.

The authors reach the conclusion that mottles in commercial butter have nothing to do with the ripening process of cream; but are caused and controlled by factors relating to the salting and working of the butter. Mottles were found to appear in salted butter in which the working had been incomplete or lacking in uniformity. A microscopical study of the water droplets in the butter lead to the conclusion that salt disturbs the emulsion of water-in-fat in butter, causing a reduction in number and increase in the size of the water droplets, giving such butter a deeper yellow color than it had before salting. The proper working of butter was found to bring about the necessary fusion of the water and brine, and their re-emulsification removed the cause of mottles. This point is usually reached, when the butter has been reduced, by working to a plastic, tough and waxy body.—R. S. B.

**2031. Phosphorus in Butter.** J. T. CUSICK. Cornell Agr. Exp. Sta., Memoir 30, 1920, 155-187.

Butter was made from cream treated in the following ways: sweet cream ripened with starter, sweet cream churned without starter, lactic acid added to cream and the mixture pasteurized, raw cream self-ripened, lactic acid added to cream and churning begun at once, sweet cream pasteurized and then churned immediately, pasteurized sweet cream ripened with starter. While all methods of handling had some influence on the phosphorus content, pasteurization had the most decided influence. After fifteen months, the samples were again analysed, and, with the exception of two samples, the phosphorus in the organic compounds was found to have broken down to the inorganic form. All samples without exception increased in soluble inorganic phosphorus during storage.

About two-thirds of the total phosphorus of the cream was retained in the buttermilk, and the remaining one-third went into the wash waters, salt exudates, and the butter. The butter finally retained about one-quarter of the phosphorus originally present in the cream.

The author feels that the substance that produces fishy flavor in butter is undoubtedly preformed in the cream by the breaking down of the lecithin. He assumes that through the solvent action of salt water and lactic acid, trimethylamine (the constituent giving fishy flavor) is formed from one of these broken down fractions. (Similar conclusions have been noted by Supplee, this volume, Abs. No. 610.)—R. S. B.

**2032. Beitrag zur Knoservierung von Butter.** (Contribution to the Subject of Butter Conservation.) S. S. SEVENSTER. Molk. Zeit., Hildesheim, 1918, 20, 676-677. *Beitrag zur Aufbewahrung von Butter.* (Contribution to the Subject of Butter Storage.) Id. 1918, 32, 42.

Those organisms which bring about the decomposition of butter, making it moldy, oily, tallowy, rancid, etc. (*Penicillium glaucum*, *Oidium lactis*, *Cladosporium butryi*, *Bact. fluorescens*, *Bact. liquefaciens*, etc.) belong to the group of obligate and facultative obligate aerobic organisms that are able to develop only in the presence of air.

Storage of the butter in refrigerators only delays the decomposition because the organisms are cold-loving or at least cold-enduring in contrast to the meat and fish destroying organisms for example, which are for the most part obligate anaerobes. The author in an investigation in which butter was held 5 months at 8 to 12°C. in a vacuum (0.5 to 1 mm. mercury) found yeast cells, numerous lactic acid bacteria, and a single mold. The rancidity degree was 1.4 cm. (A. alkali to 10 gm. butter).

At 5° to 7°C. the following results were obtained in 1918, bacterial content: very few molds, many lactic acid bacteria and a single yeast (*Torula lactis*). Rancidity degree 1.5 cm.

The control sample, butter not held in an evacuated space, gave one yeast, many lactic acid bacteria, many molds. Rancidity degree 4.2 cm. In 1918 he found innumerable molds, very many lactic acid bacteria and a rancidity degree of 4.0 cm. It showed in the evacuated sample a great increase of the desirable anaerobic lactic acid bacteria and a decrease of the molds while in the check sample the reverse was true. Favorable results were also obtained in the storage of dried milk and cream in a vacuum. (Abs. from Milch. Zent., 1919, 43, 130.)—L. A. R.

**2033. Pasteurization in Cheese Manufacture.** C. STEVENSON. N. Zealand J. Agric., 1920, 20, 5-9.

Outline of results obtained in producing cheese from pasteurized milk with the use of special regenerators. Controlled starters were used and the resulting cheese indicated an improved quality over that manufactured under normal conditions.—G. J. H.

**2034. The Cause and Control of "Buttons" in Sweetened Condensed Milk.** L. A. ROGERS, A. O. DAHLBERG AND ALICE C. EVANS. J. Dairy Sci., Balt., 1920, 3, 122-133.

"Buttons" are described as hard, reddish brown lumps of curd occurring on sweetened condensed milk. They were found to be caused by the growth of *Aspergillus repens* and pos-

sibly other molds on the surface of the condensed milk after the sealing of the can. The development of the colony is restricted by the exhaustion of the oxygen which leads to the death of the mold apparently within two weeks after the sealing of the can. The mold hyphae then slowly disintegrate until in the old and typical buttons, all evidence of the mold colony has disappeared. The button is made by a hardening of the casein, probably through enzyme action, and continues to develop after the mold colony has ceased to grow. As molds are destroyed in the process of condensing milk, the contamination causing buttons occurs after the milk leaves the pan. Under these conditions, it is felt that careful attention to the sanitation of the plant, especially protection against dust and an atmosphere laden with mold spores will be the best means to use in fighting an outbreak of the trouble. As molds do not grow in an atmosphere deficient in oxygen, sealing the cans under a vacuum of 20 inches or more is also an effective method of controlling buttons.—R. S. B.

2035. *A Score Card for City Ice Cream Plants.* F. W. FABIAN. J. Dairy Sci., Balt., 1920, 3, 230-235.

The correct and complete form of the score card previously noted (this volume, Abs. No. 607).—R. S. B.

## COMPARATIVE PATHOLOGY

(See also Numbers 2073, 2100, 2243, 2317)

2036. *Endocardite destra e arterite dela polmonare nel carbonchio sintomatico.* (Endocarditis and Pulmonary Arteritis in Symptomatic Anthrax.) E. RAVENNA. Clin. vet., Milan, 1920, 43, 1-46. (Abs. in Vet. Rev., 1920, 4, 276.)

Attention is called to the fact that sometimes in symptomatic anthrax, muscular lesions with characteristic tumefaction and crepitation may be absent. The serosity poured out from the blood is a true exudate; more scanty and of the nature of a simple serosity in the peritoneal cavity; more abundant and sero-fibrinous in the pleural cavity and especially in the pericardium. In addition to the acute inflammation of the splanchnic serous membranes, the author emphasizes the occurrence of an acute endocarditis, which has its seat of election in the right atrium and about the attached margin of the tricuspid valve. In addition, symptomatic anthrax is accompanied by an endarteritis of the pulmonary artery.

Microscopic examination reveals tissue alterations that demonstrate that symptomatic anthrax is a septicemia. The myocardium frequently presents the same picture as that observed in typical lesions of the skeletal muscles. The endocarditis, in perfect analogy with pericarditis and other inflammations of serous membranes in similar infective septicemic diseases, is an acute inflammatory process provoked by the blackleg bacillus and can be produced experimentally in susceptible animals (guinea pigs) by intravenous injection of cultures. In the pulmonary artery, in addition to the visible lesions of the intima, it is possible to demonstrate microscopically that an acute inflammatory process affects all the tunics and more especially the media. The alteration of the hepatic tissue, resulting in the production of small foci visible to the naked eye and regarded by some authors, perhaps erroneously, as specific of symptomatic anthrax, has been initiated during the life of the animal affected by the infective process. It is pointed out that the lesions result in the production of small isolated or intercommunicating cavities that are clearly delimited by hepatic cells.—W. A. H.

2037. *Il periodo d'incubazione della linfosporidiosi.* (The Period of Incubation in Epizootic Lymphangitis.) E. TORTI. Nuovo Ercolani, Turin, 1919, 24, 234-239. (Abs. in Vet. Rev., 1920, 4, 149.)

Torti points out certain possibilities of fallacy in the estimation of the period of incubation of epizootic lymphangitis in case of the disease produced by artificial means. Torti's observations were made on 14 horses and mules, in which he found that the period of incubation of the disease must have ranged from 107 to 367 days.—W. A. H.

2038. *Expériences sur le traitement des trypanosomiasis animales.* (Experiences in the Treatment of Trypanosomiasis in Animals.) R. VAN SACEGHEM. Ann. de méd. vét., Brux., 1920, 65, 305-317.

The effect of emetin and atoxyl singly and together was determined on guinea pigs artificially infected with *Tr. congolense* and *Tr. brucei*. Emetin was given in a dosage of 0.006 grams per kilogram of body weight. Atoxyl was employed in an amount of 0.02 gram per kilogram body weight.

In two experiments with emetin, the trypanosomes disappeared from the circulation immediately after the injection of the drug but recurred in a few days. Two experiments with atoxyl showed that the trypanosomes always could be found on the second day after the administration of the drug and furthermore it appeared to be very toxic to the animals.

Atoxyl and emetin used conjointly in three cases in guinea pigs resulted in complete cures in two cases, one after the second injection the other after three injections. The secondary injections were given when the flagellates were found to have recurred in the peripheral blood, this being checked up by daily blood examinations.

Because of the extreme irritative power of the emetin, it is suggested that this drug be administered intramuscularly instead of subcutaneously—This method was tried and found to be successful.

The combined atoxyl and emetin treatment was administered to a buffalo affected with a severe form of trypanosomiasis caused by *Tr. cazalbovi*. Cure was effected.—W. A. H.

2039. *La Lymphangite Épizootique. (Suite et fin.) (Epizootic Lymphangitis (concluded).)* H. VELU. Rev. gen. de méd. vét., Toulouse, 1919, 28, 491.

Prognosis, prophylaxis and treatment are discussed. Autopsyotherapy is recommended. Detailed directions for the making and use of the vaccine are given.—W. A. H.

2040. *Vom Blute rotskranker Pferde, (The Blood of Glandered Horses.)* AXEL SCHULZE. Arch. f. wissenschaft. u. prakt. Tierh., Berl., 1919, 45, 123-162.

Schulze gives detailed hematological studies of the blood of 27 glandered horses, also the results of serologic studies and the autopsy findings. Metamyelocytosis was found in two acute cases; two occult, latent cases showed no abnormalities. In the others there was an increase in the neutrophiles.

The effect of the mallein tests on the cellular elements of the blood of horses is discussed.—J. T.

2041. *Versuche über die Behandlung der Brustseuche und einiger anderer Krankheiten mit Optochin. (Investigations Concerning the Treatment of Contagious Pleuropneumonia and Certain Other Diseases with Optochin.)* KURT SCHERN. Arch. f. wissenschaft. u. prakt. Tierh., Berl., 1919, 45, 206-223.

Schern's results were sufficiently satisfactory for him to conclude that optochin—a derivative of quinine—deserves further trial in the treatment of influenza of horses.—J. T.

2042. *Bakteriologische Untersuchungen über die ein Besatzungsgebiet Belgiens unter den Militärpferden aufgetretene infektiöse Bronchopneumonie (1917-18). (Bacteriological Investigations of Infectious Bronchopneumonia of Horses in the Occupied Belgian Territory.)* THEODOR SCHRÖDER. Arch. f. wissenschaft. u. prakt. Tierh., Berl., 1920, 46, 1-47.

The author could infect healthy horses by neither inoculation nor contact. In all cases, bipolar organisms of the hemorrhagic septicemia group were found. Staphylococci, streptococci, diplococci or pneumococci were found in many cases; *B. pyocyaneus* was found in 2 cases and *B. coli* in one case. The author thinks that while the bipolar organisms cannot be considered as the primary cause—since he could not produce the disease in horses with them—they, nevertheless, play an important part in the pathologic changes and are responsible for the high mortality.—J. T.

2043. *A Contribution to the Study of Habronemiasis: A Clinical, Pathological, and Experimental Investigation of a Granulomatous Condition of the Horse. Habronaemic Granuloma.* L. B. BULL. Trans. Roy. Soc. S. Australia, Adelaide, 1919, 43, 85-141. (Abs. in Vet. Rev., 1920, 4, 164.)

In 1916, Bull published an account of a disease of horses in Victoria and South Australia, characterized by the appearance of granulomata on the penis and prepuce. The granulomata are due to the larvae of *Habronaema*, and it appears that the larva responsible is most commonly that of *H. megastoma*. The larva is very often difficult to demonstrate, and is only found in lesions of not more than 3 weeks' duration. "The larva is incapable of living in the submucous, cutaneous, or subcutaneous tissues, and, therefore, its presence in these tissues appears to be quite accidental. Evidence suggests that these larvae are introduced from without, and that they are deposited on moist surfaces during the feeding operations of *Musca domestica*, which fly acts as the intermediate host of both *H. muscae* and *H. megastoma*. When deposited on the external mucous membranes the larvae appear to be capable of pushing their way through the membrane and entering the submucosa. When lesions occur on parts other than the external mucous membranes, the moisture necessary to prevent desiccation of the larvae appears to be most usually supplied by an exudation of blood or serum. This would follow some injury to the skin of the animal, either in the form of ordinary wounds or in the form of small puncture wounds made by biting flies such as *Stomoxys calcitrans*." Prophylaxis should consist in (1) ridding horses of the adult forms of *Habronaema* that are located in the stomach, and (2) in the destruction of horse dung or its use in agriculture. In local treatment, excision of the lesions is usually the best method. If the lesion is inoperable, it should be covered by some application that will protect it against flies and possible super-infection. Bull also finds that a granuloma that affects the region of the pastern of horses in the Solomon Islands is a habronemic granuloma, and he suggests that "leeches" in North America and "bursautee" in India may have a similar etiology.—W. A. H.

2044. *Die Behandlung der Pferderäude mit Schwefeldioxid. (The Treatment of Mange in Horses with Sulphur Dioxide.)* W. NÖLLER. 1919, Berl., Verlags. u. Richard Schoets, 63 pp.

When the scarcity of oils and alcohol became more intense in the German army, the problem of control of mange in the horses became so acute, that it was made a subject of special investigation, under the direction of the author. As a result, there was developed the method of fumigation with sulphur dioxide.

Horses to be treated were placed in a cell whose door contained an opening through which the head of the animal projected. Around the margins of the opening was a gas-tight collar

of durable material, which was drawn around the neck of the horse in such a way as to securely enclose the gas. Sulphur dioxide was then introduced into the stall in the concentration of about 4-5 volume per cent and the animal exposed for one hour. The head and neck were of course treated separately, preferably with petroleum, a few days before the fumigation.

Full details as to methods of preparing the gas, its biological action, the effects of temperature and moisture are given. Directions for the construction of practical and hygienic gas chambers and accessories are illustrated by sketches and diagrams.

At the time of publication the gas treatment had been already tested out on over 70,000 horses of the German army.—W. A. R.

**2045. Cachezie osseuse des Equidés.—Cylicostomose.** (Vulgairement, au Brésil; Cara Inchada ou Grosse Face.) II. Traitement préventif ou prophylactique. (Osseous Cachexia of Horses —Cylicostomiasis. Generally in Brazil; Cara Inchada or Large Face. II. Preventive or Prophylactic Treatment.) CH. CONREUR. Ann. de méd. vét., Brux., 1920, 65, 217.

It is not known whether there is or is not an intermediate host. The worms are seldom found in the excrement because they appear to disintegrate when they leave their normal habitat as do the stomach worms of the sheep and cow. Infestation occurs through feed contaminated in the stable but to a greater extent through green feed from soil fertilized with horse manure. Horses at pasture on low swampy ground easily spread the parasite. It is impracticable to eliminate the parasite by the use of anthelmintics alone for all the forms are not destroyed and reinfestation quickly occurs. The practice of using horse manure to fertilize soil on which horse forage is to be grown should be stopped. Infected soil should be used for other animals or should be plowed under or treated with lime. Horses should be pastured only on the high dry lands.—W. A. H.

**2046. Observation d'un cas de tétanos du cheval avec localisation initial dans la région inoculée.** (Observation of a Case of Tetanus in the Horse with Initial Localization in the Region Inoculated.) M. HUYGENS. Ann. de méd. vét., Brux., 1920, 65, 298-302.

According to previous observations, tetanus in small laboratory animals usually begins in the muscles in the region of inoculation. In the case of man and the horse, this is not true. In the horse, no matter where the point of inoculation, the symptoms of tetanus usually first appear in the eye (raising of the nictitans membrane) and in the jaws (trismus).

A case of tetanus in a horse in which local symptoms preceded the general symptoms was observed. A small wound was incurred on the right side of the neck over the mastoido-humeral muscle. Two days later the neck was stiff and the region of the wound was sensitive to the touch. Manipulation of the wound caused resistance on the part of the animal and the head was turned to the right side so that the nose nearly touched the shoulder.

On the eighth day the owner noticed that this attitude of the head was becoming fixed and he was unable to induce the animal to straighten out the neck. When free and induced to move, the animal turned to the right in a circle. No signs of affection of the nictitating membrane could be discovered and there was no evidence of trismus. This condition changed quickly, however, and twelve hours later a typical case of tetanus was presented.—W. A. H.

**2047. Diseases of Lambs. I. Dysentery.** S. H. GAIGER. Scottish J. Agric., 1920, 3, 174. (Abs. in Vet. Rev., 1920, 4, 271.)

The author reports a preliminary investigation of a disease of lambs known as "white scour" or "red scour" that occurs in spring. The disease is distributed over certain wide areas in Scotland south of a line between the Firths of Forth and Clyde and in the north of England. The disease affects lambs up to about a fortnight old—very rarely a few weeks old. It may be quickly fatal, and the lamb that was bright and lively one day may be found dead the next. A yellow scour is present, and the feces are frequently tinged with blood. If the lamb lives long enough this changes to a black scour.

Examination of three cases found alive showed severe inflammation of the large intestine, and scattered small circular necrotic areas the size of a lentil. These had bright yellow centres and bright red circumference. The lesions could be easily seen before the bowel was opened. Some of the areas seemed to be on the point of producing perforation, though actual perforation was not found. The small intestine was almost normal. A bacillus was obtained in pure culture from the liver, abdominal lymph glands, kidneys, and urine of all three lambs. Study showed that it was unlike any hitherto described variety of *Bacillus coli*. Young rabbits of a few weeks old died in from 24 to 48 hours after subcutaneous inoculation of 1 cc. of a bouillon culture. It is yet impossible to say with certainty that the bacillus is the causative organism of the disease, but it appears probable that it is so.—W. A. H.

**2048. Infectious Abortion of Swine.** L. P. DOYLE AND R. S. SPRAY. J. Infect. Dis., Chicago, 1920, 27, 165-168.

Attention is called to the increase of infectious abortion in swine and to the severe losses caused by this disease. Cultures from the afterbirth of a sow yielded an organism similar to the *B. abortus* of Bang, except that it produced less acid in arabinose serum water. Antiserum to *B. abortus* agglutinated the strain from swine, and animals treated with the swine strain produced agglutinins for the usual cattle strains of *B. abortus*. Absorption of agglutinin reactions confirmed the complete antigenic identity of the two strains. Sixty-two per cent of swine from herds with a history of infectious abortion gave positive agglutination reactions in serum dilutions of 1-100 with *B. abortus* from cattle.—S. B-J.

#049. *Pathogenic Bacteria in Hog Cholera Blood.* L. P. DOYLE AND R. S. SPRAY. J. Infect. Dis., Chicago, 1920, 27, 245-249.

After the fifth day following inoculation of hogs with blood containing hog cholera virus, many of the cholera infected hogs had gas-producing organisms in their blood. Blood containing these gas-producing organisms was fatal to rabbits, while virus containing blood free from gas-producing bacteria was not harmful to rabbits. Hogs, however, were not harmed by large intravenous injections of the blood which contained organisms which fermented dextrose with the production of gas.

The gas-producing organisms of hog cholera blood were isolated and found to be either *B. paratyphosus* A, *B. paratyphosus* B, *B. suispestifer*, and several intermediates. These intermediates are closely related to *B. suispestifer*, though not serologically identical with the typical *suispestifer*.—S. B.-J.

#050. *Contribution à l'étude de l'immunisation du bétail atteint de piroplasmose bigeminum par l'emploi du trypanbleu.* (A Contribution to the Immunization of Cattle Affected with *Piroplasma bigeminum* by the Use of Trypan Blue.) G. URBAIN. Ann. de méd. vét., Brux., 1920, 65, 210.

Trypan blue is effective in destroying *Piroplasma bigeminum* in the body but has no effect on *Anaplasma marginale*.

The method of immunizing animals is as follows: The animals are infected naturally by placing infected ticks on them or artificial inoculation is accomplished by injecting virulent blood. In 15 to 20 hours after natural inoculation or 7 to 10 hours after artificial inoculation, the thermometer registers the first febrile reaction. At this time, the trypan blue is injected in the dose of one gram minimum per 100 kilograms live weight. If the temperature does not fall within 36 hours after the injection it should be repeated. It is immaterial whether the drug is injected intravenously or subcutaneously. In the latter case the temperature falls less rapidly.—W. A. H.

#051. *Observations sur la pseudo-tuberculose des cobayes.* (Observations upon Pseudo-Tuberculosis of Guinea Pigs.) R. VAN SACEGHEM, presented by F. Mesnil. Ann. de méd. vét., Brux., 1920, 65, 302-304.

Pseudo-tuberculosis of guinea pigs occurs as a very destructive disease in certain guinea pig establishments. The epizootic studied occurred in winter. The pigs became emaciated, the appetite was capricious. The duration of the disease was several weeks to several months.

At autopsy the liver and spleen were filled with tubercles. These were also usually observed in the wall of the intestine. The mesenteric lymph nodes were hypertrophied and occasionally abscessed. The lungs were seldom affected.

The tubercles were easily enucleated and were either isolated or confluent and sometimes became abscesses containing a greenish, very characteristic pus. Examination of a fresh tubercle revealed a hyaline membrane enclosing a solid magma. This magma showed degenerated cells, chromatolysis and polynuclear leucocytes. It was difficult to demonstrate bacteria in this material.

The organism causing pseudo-tuberculosis of the guinea pig was found to be a cocco-bacillus which was indistinguishable morphologically from that of pest. The organism was classified as belonging to the Pasteurella group. The rat was not susceptible to this organism. Vaccination with this organism protected the rat against pest. The insusceptibility of the rat to this organism permits of easy differentiation between it and the organism of pest.

Guinea pigs injected with the organism of pseudo-tuberculosis died regularly after two or three days with characteristic lesions; liver and spleen full of tubercles, ganglia hypertrophied and lungs normal.

Guinea pigs were successfully immunized against this infection by the injection of 1 cc. of a bouillon culture which had been heated at 60°C. for two hours.—W. A. H.

#052. *Further Studies on "Blackhead" in Turkeys, with Special Reference to Transmission by Inoculation.* E. E. TYZZER AND M. FABYAN. J. Infect. Dis., Chicago, 1920, 27, 207-239.

A form of blackhead disease in turkeys was produced by the subcutaneous inoculation of lesions of liver from acute cases, and the disease was propagated indefinitely by subinoculation into normal turkeys. This form of the disease is characterized by a primary local swelling and necrosis of the tissue from 5 to 7 days after inoculation, by the occurrence of secondary lesions in the lungs and later by the development of lesions in the liver and kidneys through the dissemination of the parasite from the lungs. The turkeys show loss of weight, anorexia, sulphur colored droppings, coughing and dyspnea. The inoculated disease is invariably fatal. The parasite, *Histomonas meleagridis*, is demonstrable in the lesions.

The inoculations of chickens were negative. In one newly hatched chick, however, a local lesion at the site of inoculation and secondary lesions of the lung were produced. Thirty per cent of pigeons were susceptible to the extent that local lesions developed 5 to 8 days and then regressed. Rabbits, guinea pigs and mice could not be infected by inoculation.

An attempt to transmit the disease through a species of blowfly (*Calliphora erythrocephala*) failed.

Tartar emetic and quinine failed to check the course of the experimental infection.

The transmission of the disease from one turkey to another by inoculation removes many uncertainties which attended former experiments dependent upon contact infection among

turkeys. No flagellates appeared in the ceca of newly hatched chickens following the ingestion of large amounts of blackhead virus. In the experimental disease, no evidence was found suggesting a transformation of the cecal trichomonad of turkeys into the parasite of blackhead.—S. B-J.

**#053.** *Kasuistische bakteriologische, pathologisch anatomische sowie experimentelle Untersuchungen über Hühnertyphus.* (*The Casuistics, Bacteriology, Pathologic Anatomy, as Well as Experimental Investigations of Fowl Typhoid.*) W. PFEILER AND R. STANDFUSS. Arch. f. wissensch. u. prakt. Tierh., Berl., 1919, **45**, 163-205.

The authors discuss in detail the occurrence, spread and transmissibility of the disease, its symptoms, pathologic anatomy and causative agent. They find that the disease has an acute and a subacute form, and that it is transmitted from bird to bird by cohabitation. Birds became infected when placed in pens where the floors were sprinkled with bouillon culture of the causative agent or when fed or when injected subcutaneously.

The anatomical changes are similar to those found in septicemia with hemorrhagic enteritis. The subacute form may present ulcerations of the mucous membranes of the stomach and intestines. In this outbreak, the striking characteristic was hempseed-sized grayish-yellow nodules in the heart muscle and sometimes in the lungs, liver and kidneys.

The cause is a Gram-negative, non-motile rod of the colon-typhoid group; in animal body, it is bipolar. Serologically it falls between the typhoid and paratyphoid B groups.—J. T.

**#054.** *Noma in the Dog.* J. McL. PHILLIPS AND F. BERRY. J. Infect. Dis., Chicago, 1920, **27**, 136-138.

A spaniel suffering from distemper developed a gangrenous ulcerative lesion of the jaw and lips, similar to noma as seen in man. Fusiform bacilli and spirilla were found occasionally, but not cultivated from the lesion.

Attention is called to the possibility of the transmission of Vincent's organisms from dogs to man.—S. B-J.

## PARASITIC DISEASES

(See also Numbers #033, #045, #313)

**#055.** *A Method of Concentration of Parasitic Eggs in Feces.* W. H. GATES. J. Parasitol., Urbana, Ill., 1920, **7**, 49.

"After straining through a sieve a large quantity of material, or using a smaller quantity without this, feces are centrifuged first with water to wash off surplus lighter material, and later with sodium chlorid, or better, calcium chlorid solution, sp. gr. 1.250, to remove the bulk of the material and float the eggs practically free from sediment. The top one or two cubic centimeters are then removed with a pipette, drawing chiefly from the rim of the meniscus, and centrifuged again with water, which throws the eggs to the bottom. The water is then poured off, leaving all of the sediment in the bottom. This sediment is agitated vigorously by holding the tube in the closed hand and pounding on the table. This stirs up all or nearly all of the eggs which may have stuck to the bottom, though a few eggs cannot be removed except with a brush. The sediment is quickly poured into a small dish. The centrifuge tube is rinsed out by squirting water forcibly into it and this also is poured immediately into the dish. The eggs settle rather rapidly and are loosened from the bottom by forcing a little water around the edge to produce a slight whorl. Then before the eggs have a chance to settle, agitate the dish in the same circular direction so that the water tends to form a vortex, gradually diminishing the motion until it is hardly more than a jar. Practically all of the eggs will be found to have settled within a very small field."—W. A. R.

**#056.** *A Malaria Survey in the Malay Archipelago.* N. H. SWELLENGREBEL AND J. M. H. SWELLENGREBEL-DEGRAAF. Parasitology, Cambridge, 1920, **12**, 180-198.

Of 21 Anopheline species in the Malay Archipelago, *Myzomyia ludlowi* is the most important vector of malaria in that region, and shows the highest degree of natural infectability.

Next in order with regard to epidemiological significance are (2) *Myzomyia aconita*, *Nyssorhynchus maculatus* (perhaps also *Stegomyia aitkeni*); (3) *Neomyzomyia leucosphyræ*, *Myzorhynchus umbrosus*; (4) *Nyssorhynchus fuliginosus*, *Myzorhynchus sinensis* (? = No. 6); (5) *Celia kochii*; (6) *Myzomyia rossii*, *Myzorhynchus barbirostris*, *Neomyzomyia punctulata* (*tesse-lata*); (7) *Myzomyia indefinita*.

Owing to the characteristic nature of the habitats of larvae of *M. ludlowi* specific sanitation is practicable in malarious regions where this species is the chief vector. In other words, sanitary works directed against this particular species may be carried out without including all other Anophelines in the locality.

Antimalarial measures against *M. aconita* and *N. maculatus* are hard to carry out but amelioration may be expected as a result of improved methods of rice cultivation.

In general, the eradication of Anopheline larvae in the Malay Archipelago is difficult because they breed in all kinds of temporary collections of water, which constantly reappear during the rainy season.—W. A. R.



2057. *The Anopheline Waters of Southern Flanders. Being a Report on the Area Occupied by the British Second Army in France.* A. D. PEACOCK. Parasitology, Cambridge, 1920, 12, 234-252.

From surveys made during the summers of 1915, 1916, September, 1918, and from various collectors, it was determined that the commonest Anopheline mosquito in the area occupied by the British Second Army in Southern Flanders is *Anopheles maculipennis*.

About one pool in every seven in this region is Anopheline. Twenty-five per cent of these pools had numerous larvae, though the degree of infestation was low. An epidemic of malaria is unlikely.—W. A. R.

2058. *One or Several Species of Malaria Parasites. A Review of Recent Work Bearing on this Question.* BRUCE MAYNE. Pub. Health Rep., Wash., 1920, 35, 2846-2858.

A review of the literature, in which is discussed the question whether the plasmodium of malaria is a plural organism or a single polymorphic organism is given, as well as the personal observations of the author. Although many investigators incline to the view that there is only one species of malarial parasite and exhaustive tests carried out by the author showed a change of findings (from parasites of *P. falciparum* to *P. vivax*) on microscopical examinations, it is not believed by the author that it can be definitely proved that there is not a plurality of species.—I. A. B.

2059. *Malariaezidive und Sonnenlicht. (Malarial Recurrences and Sunlight.)* F. LENZ. München. med. Wchnschr., 1920, 67, 697-698.

The spring curve of malaria incidence in Munich is essentially a recurrence curve for that climate. Sunlight is considered an important cause in bringing about recurrences. The characteristic tendency for the malarial gametocytes to react to sunlight by multiplication represents a selective adaptation of the plasmodia to the period of flight of anopheles mosquitoes.—B. C.

2060. *Wohlfartia vigil (Walker) as a Human Parasite (Diptera-Sarcophagidae).* E. M. WALKER. J. Parasitol., Urbana, Ill., 1920, 7, 1-7.

The type species of the genus *Wohlfartia*, a Sarcophagid fly has long been known as a parasite of man and various domestic animals, particularly in Russia. Such habits however, are unknown for the other European species of *Wohlfartia* and nothing whatever has hitherto been known of the larval habits of the North American species.

In the present paper are reported two instances of the occurrence of larvae of *W. vigil* under the skin of infants at Toronto, Canada. They were found in boil-like sores up to 2 cm. in diameter, on the neck, chest and arms. Each swelling in the case especially reported had a round or elliptical opening about 3 mm. in diameter and from some of these larvae were squeezed out. Usually there was a single larva in each swelling but from one of them three larvae were expelled.

From larvae fed upon raw beef four adults were obtained and the species determined.—W. A. R.

2061. *Notes d'Helminthologie Brésilienne, Dixième Série, 17. Le Davainea bothrioplitis (Piana, 1881-1882.) (Notes on the Helminthology of Brazil. 10 ser. No. 17, Davainea bothrioplitis (Piana, 1881-1882).)* P. S. DE MAGALHAES. Arch. de parasitol., Par., 1919, 16, 481-502.

The tendency of present day workers to regard *Davainea bothrioplitis* (Piana) from fowls as a synonym of *D. echinobothrida* (Megnin) is shown to be wrong. It is clearly separated by the fact that its genital pores are unilateral and that it possesses a long neck. Reference to Piana's original description shows that these and other characters discussed were brought out clearly and hence the confusion which has originated seems the stranger.—W. A. R.

2062. *A New Course for Migrating Ancylostoma and Strongyloides Larvae after Oral Infection.* SADA O YOSHIDA. J. Parasitol., Urbana, Ill., 1920, 7, 46-48.

Whether entering the body through the skin or through the mouth the larvae of *Ancylostoma* and of *Strongyloides* sooner or later migrate into the lungs, before taking up their adult position in the intestine.

From experiments on guinea pigs, it is concluded that larvae introduced into the alimentary canal commonly reach the stomach and intestine, and piercing the walls of these regions enter the abdominal cavity and thence proceed to the pleural cavity by passing through the diaphragm.—W. A. R.

2063. *Dibothriocephalus taenoides Leon. A New Case in Roumania.* N. LEON. J. Parasitol., Urbana, Ill., 1920, 7, 43-45.

In 1916, the author described in the Centralblatt f. Bakt., I Abt. Originale, a new species of *Dibothriocephalus* from man, which differed in form and shape of proglottids, form of uterine rosette, musculature, and color from *D. latus*. The present paper records a second phase.—W. A. R.

2064. *A Possible Intermediate Host of Fasciola hepatica L. 1758 in North America.* MARK F. BORD. J. Parasitol., Urbana, Ill., 1920, 7, 39-42.

Though fluke disease of sheep and cattle caused by *Fasciola hepatica* is found in both North and South America, none of the known snail hosts are found in this continent.

Since fluke disease has appeared among sheep grazing on Galveston Island it seemed probable that the intermediate host must exist there. Collections revealed three species of freshwater snails: *Limnaea humilis*, Say, *Physa fontinalis acuta* Drap., and *Succinea grosvenorii*, Lea.

Attempts at experimental infection of reared snails with the miracidia of *F. hepatica* gave evidence that they could develop in *Physa fontinalis acuta*. The experiments were not extended to *Limnaea humilis*, which Stiles has suggested as the probable intermediate host of the fluke in this country.—W. A. R.

**2085. A New Record of *Taenia confusa*, with Additional Notes on its Morphology.** A. C. CHANDLER. J. Parasitol., Urbana, Ill., 1920, 7, 24-38.

In a collection of parasites from the Medical School of the University of Texas was a supposed *Taenia saginata*, which on closer study proved to be *Taenia confusa* Ward, 1896, previously known only from two Nebraska specimens. Though differing in some details, especially measurements, from the description of the latter species, as given by Guyer, 1898, there is no serious doubt as to its identity.

Emphasis is placed on the fact that the specimen at hand largely bridges the gap between *Taenia confusa* Ward and *Taenia bremneri* Stephens, which is very common in the natives of northern Nigeria. The writer believes that there is every reason to believe that the two species are identical and that *Taenia confusa* like *Necator americanus* was brought to America by slaves.—W. A. R.

**2086. A New Species of Cestode (*Oochoristica erinacei*) from the Hedgehog.** F. J. MEGGITT. Parasitology, Cambridge, 1920, 12, 310-313.

To the 5 species of cestodes already known from the hedgehog is added a new species, *Oochoristica erinacei*, distinguished by the possession of numerous testes situated posteriorly to the female organs. A key to 17 species of the genus *Oochoristica* from various hosts is included.

The desirability of citing the technical name of the host in such descriptions should be noted. Workers in other parts of the world may be less clear than the author as to the identity of a "hedgehog from Mesopotamia."—W. A. R.

**2087. A Contribution to our Knowledge of the Tapeworms of Poultry.** F. J. MEGGITT. Parasitology, Cambridge, 1920, 12, 301-310.

With the primary purpose of completing already existing but inadequate description the author has studied *Hymenolepis columbae*, *H. coronula*, *H. gracilis*, *Cotugnia digonophora*, *C. brotogeris*, and *C. fastigata*. The last mentioned is a new species from domestic ducks in Rangoon.

A key to the 9 species of the genus *Cotugnia* is included.—W. A. R.

**2088. Sarcoptic Scabies in Man and Animals. A Critical Survey of our Present Knowledge Regarding the Acari Concerned.** CECIL WARBURTON. Parasitology, Cambridge, 1920, 12, 265-300.

A revision of the subject of sarcoptic scabies in man and animals is urgently needed. The immediate object of the present paper is to collate and present in a compact form the conclusions of previous workers, as an aid to such revision.

It is pointed out that one form of *Sarcoptes* should be so completely studied that differences of structure in forms thought to be distinct from it may be clearly recognized, thus laying a foundation for a comparison between the *Sarcoptes* of different animals.

If the human *Sarcoptes* is selected for the study care should be taken to select patients not occupied in the tending of domestic animals, and especially the horse, lest there be suspicion of contagion from such sources. There would be some advantages in selecting instead the form known as *equi*.

Chaetotoxy, always important in Acarina, should be studied with especial care. As Canada balsam has almost the same refractive index as the hairs, it is absolutely necessary to examine them in some medium which will render them more visible. Discrepancies in published descriptions are in part attributable to neglect of this precaution.

The dorsal scales, notothoracic cones, notogastral spines, and the leg armature and chitinous framework should be subjected to very close scrutiny.

In comparisons of mites from different animals all of these characters should be compared. Decisions as to average size should be based on measurement of a sufficient number of specimens. Experiments in the artificial transference of scabies from one animal to another should be included and the possible effect of the condition of health of the recipient host should be carefully considered.—W. A. R.

**2089. A New Nematode from the Rat.** SADUMA YOKOGAWA. J. Parasitol., Urbana, Ill., 1920, 7, 29-33.

An apparently previously undescribed parasite which was found commonly in the Norwegian rat, *Epimys norvegicus*, at Baltimore, Md., is here described in detail under the name *Heligmosomum muris*. The new species is closely related to *Heligmosomum braziliense* Travassos.—W. A. R.

**2070.** *The Development of Gregarines and their Relation to the Host Tissues: III.* In *Gregarina rigida* (Hall) Ellis. MINNIE WATSON KAMM. J. Parasitol., Urbana, Ill., 1920, 7, 23-28. Continuing her studies on the effect of gregarines on host cells, the author has discussed ten successive stages in the life-history of *Gregarina rigida*, a very common parasite of the Acridiidae.

"This species possesses an epimerite which develops in the sporozoite as an ameboid papilla, becoming a long slender neck which is thrust through the intima between two epithelial cells rather than one, where it obtains a holdfast and develops at the cell apex a rounded knob for an epimerite."

Parasitized cells are affected only mechanically, being pushed aside during the parasite occupancy.—W. A. R.

**2071.** *Cestodes avium. Contributo alla fauna elmintologica sarda. (Bird Cestodes. Contribution to the Helminthological Fauna of Sardinia.)* PASQUALE MOLA. Arch. de parasitol., Par., 1919, 16, 557-578.

The parasitic worms of Sardinia have received scant attention. In the present paper are discussed those collected during the years 1907-1912 from over 200 birds, and also those previously recorded by Parona.

Thirty-five species of avian cestodes, representing ten genera constitute the total reported. An annotated list of these and a host list are included.—W. A. R.

**2072.** *Observations on the Geographical and Ethnological Distribution of Hookworms.* SAMUEL T. DARLING. Parasitology, Cambridge, 1920, 12, 217-233.

Struck by the peculiar geographical and racial distribution of the two common species of hookworm infecting man the author has considered its bearing on certain ethnological problems.

The races of mankind living in tropical and sub-tropical regions are infested with one or more species of hookworms. In the migrations of these peoples the immigrants have carried their peculiar species of hookworms into regions occupied by peoples having a different worm-species-content, and by an examination of the intestinal worms of a people, the geographical and ethnic origin of their hosts can, within certain limits be divined.

This is illustrated clearly by present day conditions in tropical countries where certain movements of populations are going on in response to a demand for agricultural laborers. The effect of migration into a country whose people have a different index from that of the immigrants is to make the immigrant take on the worm index of the autochthones while the index of the latter is more or less modified by the implantation of the worm species of the immigrant. This is actually taking place in Malaya, Fiji, Guiana, and Brazil.

Changes analogous to these that are taking place under our very eyes, may be assumed to have taken place centuries ago among other peoples, and if among a people today whose worm formula is 99 per cent *Necator* we encounter a group who are harboring 15 per cent *A. duodenale* or any notable number of that species we are entitled to assume that the hookworms of the latter people are derived from an alien stock.

Supporting this thesis the author presents a considerable number of interesting and suggestive data which tend to show that the relative number and species of hookworms may furnish indications as to the ethnic origin of a people about whose history there is no record. He urges the importance of surveys of all ethnic groups of people before there occurs that mixing of stocks which will efface the individualities of species formulas. Such surveys are particularly desired in America among various North, South and Central American tribes, in Asia (sub-tropical), the Philippines, in Melanesia, Micronesia, Polynesia, Australia, and in Madagascar and Easter Island.—W. A. R.

**2073.** *Dell' Anaplasma marginale. (Corpi di Jolly nel sangue anemico. Forme anaplasmatiche di piroplasmi.)* (Anaplasma marginale. The Bodies of Jolly in Anemic Blood. Anaplasmic Form of Piroplasms.) G. DI DOMIZIO. Clin. vet., 1919, 42, 203-220; 237-251; 292-311. (Abs. in Vet. Rev., 1920, 4, 160.)

A contribution to the debated point regarding the specific identity of the so-called anaplasms or marginal points and their parasitic nature. The morphology of *Anaplasma marginale* (and its variety *centrale*) and of *Anaplasma argentinum*, as described by Theiler and Lignières, is different from that of the Jolly bodies of anemic blood. The considerably higher percentage of erythrocytes invaded by anaplasms is of especial importance in this connection. The higher percentage of corpuscles invaded also distinguishes the anaplasms from the so-called anaplasma-like forms of piroplasms.—W. A. H.

**2074.** *On the Classification of the Ascaridae. I. The Systematic Value of Certain Characters of the Alimentary Canal.* H. A. BAYLIS. Parasitology, Cambridge, 1920, 12, 253-264.

The old genus *Ascaris* "is intolerably unwieldy, and it is clearly time that effective steps be taken to split it up into smaller groups, if only for the sake of convenience."

Though the fact has been either forgotten or ignored by more recent workers, Dujardin (1845) divides the "true Ascarids" into four sections on the basis of the structure of the alimentary canal. With the idea of obtaining more definite knowledge of the systematic value of the structure of the alimentary canal the author re-examined a number of species of Ascarids available in the British Museum.

Of the twenty species studied, the hosts of which include mammals, birds, reptiles and fishes, no example of the typical simple Ascarid structure of the alimentary canal was met with. In every case some modification of the oesophagus was present, or some caecum or appendage either of the oesophagus or intestine or both.

Five main types of structure were encountered:

I. Oesophagus muscular throughout, opening directly into the intestine, without posterior ventriculus or distinct bulb. A forwardly-directed caecum springs from the intestine. No oesophageal appendix. Examples: *Ascaris holoptera*, *A. colura*.

II. Oesophagus slender, with a more or less distinct globular bulb at the base. The intestine is produced forwards as a long caecum. No oesophageal appendix. Examples: *Ascaris halichoris*, *Dujardinia helicina*.

III. Oesophagus with a posterior glandular portion, or ventriculus, of elongate or oblong shape and often bent in a sigmoid manner. No oesophageal or intestinal caeca. Examples: *Ascaris rosmari*, *A. similis*.

IV. Oesophagus with a posterior glandular portion, or ventriculus, often bent so as to open into the intestine laterally. An intestinal caecum present. No oesophageal appendix. Examples: *Ascaris decipiens*, *A. depressa*, *A. ensicaudata*, *Porrocaecum crassum*, *Terranova antarctica*, probably *Ascaris semiteres*, *A. serpentulus*. (The material available for the study of the last two forms did not permit of satisfactory examination.)

V. Oesophagus with a reduced posterior ventriculus, giving off a backwardly-directed glandular appendix. An intestinal caecum also present. Examples: *Ascaris aucta*, *A. microcephala*, *Contracaecum spiculigerum*, *Kathleena osculata*, *K. radiata*, *K. rodhaini*, *K. tricuspis*.

As a result of his studies, Baylis amends the grouping proposed by Railliet and Henry, 1912, placing in their sub-family Anisakinae the type genus *Anisakis* and a part of the former sub-family Heterocheilinae. Of the four genera of the Heterocheilinae not included—*Heterocheilus*, *Typhlophorus*, *Goezia* and *Crossophorus*, the last named is placed in a sub-family by itself, *Crossophorinae*, n. subfam. V. Railliet and Henry's sub-family Heterocheilinae is restricted to the two genera *Heterocheilus* and *Typhlophorus*, and *Goezia* is placed by itself in another sub-family *Goeziinae*.—W. A. R.

2075. *Sur quelques Espèces du genre Diplotriaena Railliet et Henry. (On Certain Species of the Genus Diplotriaena Railliet and Henry.)* G. R. BLANC. Arch. de parasitol., Par., 1919, 16, 546-556.

The filarial worms of the genus *Diplotriaena* live in the body cavity of various birds. Little is known concerning their biology. Von Linstow has frequently observed in the blood of Corvidae, microfilariae which coincide with the presence of adult *D. tricuspis* in the general cavity. The nineteen species already known are listed with data as to host and original descriptions. To these the author adds two new species, *Diplotriaena henryi* and *D. parisi*.—W. A. R.

2076. *On the Life History of Bucentes (Siphona) geniculata (Diptera: Tachinidae), Parasite of Tipula paludosa (Diptera) and other species.* JOHN RENNIE AND CHRISTINA H. SUTHERLAND. Parasitology, Cambridge, 1920, 12, 199-211.

There are two generations of the parasite during the year, the winter months being spent as larvae within their hosts (Tipula larvae). The summer generation begins in June and requires about 6 weeks to complete its cycle.

The larva of the parasite lives in the body cavity, attached to one of the main tracheal trunks of its host by means of a chitinous sheath-like structure.

Details of the structure and habits of the adult are reserved for a future paper.—W. A. R.

2077. *Malformations in Ticks.* L. E. ROBINSON. Parasitology, Cambridge, 1920, 12, 175-179.

Various malformations described "are probably of the result of some mutilation of the tick during the course of the preceding nymphal phase," experimental investigation having shown that ticks have to a considerable degree the power of regenerating injured or amputated appendages.—W. A. R.

2078. *On the Natural Occurrence of Herpetomonads (Leptomonads) in the Blood of a Fish, Dentex argyrozona, and Its Significance.* H. B. FANTHAM AND ANNE PORTER. J. Parasitol., Urbana, Ill., 1920, 7, 16-22.

The herpetomonads are parasites of invertebrates, and hence especial interest attaches to this first record of their natural occurrence in the blood and internal organs of a fish, *Dentex argyrozona* from St. James, near Cape Town.

Flagellated forms 5 to 24 microns long and 1.5 to 2.5 microns broad occurred in the heart blood, and rounded non-flagellate Leishmania-like forms were seen in the internal organs.

The findings are of importance in view of the numerous experiments carried out by the authors and others on the successful infection of vertebrates with herpetomonads and their relation to Leishmania.—W. A. R.

2079. *A New Cystophorous Cercaria from California.* W. W. CORT AND ELINOR B. NICHOLS. J. Parasitol., Urbana, Ill., 1920, 7, 8-15.

A number of specimens of *Physa occidentalis* from a reservoir near Oakland, Cal., were heavily infested with a new cystophorous cercaria which is described under the name *Cercaria californiensis*. The infection was localized in the digestive glands of the snail.

The new cercaria shows no adaptive larval characters and but slight development of primordial adult characters. The tail is very remarkably differentiated, consisting of a central cuticular vesicle, the sphere, and various projections and appendages.—W. A. R.

**#080.** *A Survey of Cawston's Species of South African Cercariae.* ERNEST CARROLL FAUST. Parasitology, Cambridge, 1920, 12, 212-216.

Largely through the work of F. G. Cawston, 16 species of cercariae from snails of the Transvaal and Natal are known. In addition, many valuable data regarding the extent of infestation and seasonal distribution have been accumulated.

The present paper summarizes some of these data and presents a detailed description of *Cercaria pigmentosa* Cawston, previously inadequately described, and of a new species of echinostome larva, *Cercaria 30-acanthostoma*.—W. A. R.

### TROPICAL DISEASES

**#081.** *The Etiology of Dengue Fever.* CHARLES F. CRAIG. J. Am. M. Ass., Chicago, 1920, 75, 1171.

The author calls attention to the close relation of dengue fever to yellow fever. It resembles yellow fever clinically and in its seasonal occurrence. Dengue fever is transmitted by a mosquito, *Culex fatigans*, and the virus belongs to the class of filtrable viruses. The close resemblance to yellow fever, the author thinks, renders the hypothesis likely that a spirochete is the etiologic factor.—P. G. H.

**#082.** *Tropical Diseases Due to Microscopical Organisms in the Balkanic Zone.* ALDO CASTELLANI. J. Roy. Micr. Soc., Lond., 1919, September, part III, 209-220.

An account is given of the occurrence and types of malaria in the Balkan countries, likewise a discussion of typhus, methods of transmission and prevention, relapsing fever, papataci fever, camp jaundice, paratyphoid, Malta fever, kala-azar, bronchomycosis and others.—R. E. B.

**#083.** *Yellow Fever at the New Orleans Quarantine Station.* Anon. Pub. Health Rep., Wash., 1920, 35, 2274-2275.

Description of a case of yellow fever imported from Vera Cruz.—I. A. B.

### EPIDEMIOLOGY

(See also Number 2157)

**#084.** *The Apparent Rate Disappearance of Diphtheria Bacilli from the Throat After an Attack of the Disease.* P. HARTLEY AND C. J. MARTIN. Proc. Roy. Soc. Med., Lond., July, 1920, Section Epidemiol. & State Med., 276-289.

The material considered in this paper includes 3070 observations upon 457 cases of diphtheria. The authors found that the rate of disappearance of diphtheria bacilli from the throat followed a definite formula and could be calculated with considerable accuracy. The exceptions to the rule were evidently those individuals who had abnormal throats or tonsils.—G. H. R.

**#085.** *Typhoid Fever at Salem, Ohio.* J. Am. M. Ass., Chicago, 1920, 75, 1498.

During the first part of October enteritis was prevalent and about one-half of the population was attacked. An emergency chlorinating plant was installed. Boiling the drinking water was advised. Typhoid fever cases were reported soon. It was found that one of the gravity lines connecting one group of wells with the reservoir was polluted. The milk supply was not incriminated.—P. G. H.

**#086.** *Outbreak of Gastro-enteritis and Typhoid Fever Caused by Pollution of Public Water Supply at Schenectady, N. Y.* THEODORE HORTON. Pub. Health Rep., Wash., 1920, 35, 2549-2556.

An epidemic of gastro-enteritis followed immediately after gross pollution of wells supplying water to Schenectady, N. Y. Fifteen days after the first pollution of the water one case of typhoid developed, followed by others, in all 53 cases. Pollution of the water occurred during a period when the elevation of the Mohawk river exceeded the level of an abandoned suction pipe and pipe gallery connected with one of the wells.—I. A. B.

**#087.** *Industrial Epidemiology.* WILLIAM ALFRED SAWYER. J. Am. M. Ass., Chicago, 1920, 75, 1041.

Vaccination for small pox should be made compulsory. Typhoid vaccination should also be made compulsory. Vaccination against typhoid may be carried out on Friday afternoon or Saturday to give the vaccinated employees rest over Sunday. In the case of diphtheria all sore throats should be cultured and the patients sent home. Those exposed should receive an immunizing dose of antitoxin. The application of the Schick test may prove of great value. Tuberculosis can be controlled by proper sanitary conditions in the factory and systematic examination of employees. Little is known of respiratory diseases, but care and elimination of patients will help in controlling them. In the case of venereal diseases industrial interests should cooperate with health authorities in attempts at control.—P. G. H.

## PUBLIC HEALTH REGULATION

2088. *Co-operative County Health Work in North Carolina.* B. E. WASHBURN. South. M. J., Birmingham, 1920, 13, 710-712.

A description of the work as carried on by the county and state health departments.—J. H. B.

2089. *Recent Advances in Diagnosis and Treatment of Syphilis and Gonorrhea in Relation to Public Health Measures.* DAISY M. O. ROBINSON. South. M. J., Birmingham, 1920, 13, 647-654.

A general descriptive article.—J. H. B.

2090. *Die Anzeigepflicht bei Geschlechtskrankheiten. (The Compulsory Reporting of Venereal Diseases.)* O. ROSENTHAL. Berl. klin. Wchnschr., 1920, 57, 365-369.

It is argued that the best interests of the public health are endangered by making the reporting of venereal diseases a compulsory matter. Physicians should be empowered to report these diseases when they believe that reporting is necessary to prevent the spread of infection, but the reporting should not be compulsory.—B. C.

## DISINFECTION AND GROWTH INHIBITION

(See also Number 2174)

2091. *Methods of Cultivating the Gonococcus and of Testing Germicidal Agents Against it.* ERNEST O. SWARTZ AND DAVID M. DAVIS. J. Am. M. Ass., Chicago, 1920, 75, 1124.

The authors have used a medium for cultivating the gonococcus successfully in 12 to 24 hours. The medium is a 2 per cent beef or veal infusion agar, prepared in the ordinary manner and adjusted to pH 7.6 with phenolsulphonphthalein as indicator. The reaction is about 7.4 after autoclaving. Sterile ascitic, pleuritic or hydrocele fluid is added to the melted agar in the proportion of 1 part of fluid to 2 parts of agar. The tubes are slanted. They are corked. Inoculation is made plentifully; the medium should be at body temperature and kept so. To reduce the oxygen pressure the tube is passed longitudinally through a flame 3 times and quickly corked. The air is sufficiently heated to lower the pressure from 70 to 100 mm. or about 10 per cent of atmospheric pressure. The medium is not coagulated and the gonococci are not injured. A large series of drugs were tested for their germicidal effect on the gonococcus.—P. G. H.

2092. *Ueber die Bakterientödlende Wirkung von Silberpräparaten. (The Bactericidal Effect of Silver Preparations.)* ERICH LESCHKE AND MAX BERLINER. Berl. klin. Wchnschr., 1920, 57, 706-707.

Colloidal silver preparations examined *in vitro* show practically undiminished disinfecting power in blood serum. The more highly dispersed products had the greater bactericidal and growth-retarding power. Their effectiveness was exceeded by the silver-dye compounds, argochrome and argoflavin.—B. C.

2093. *Untersuchungen über die oligodynamische Fernwirkung. (Studies on the Oligodynamic Distance Effect.)* WILHELM SPÄT. Wien. klin. Wchnschr., 1920, 33, 509-511.

Contrary to the claim of Saxl that the distance effect of metals in killing microbes is due to some mysterious radiation Spät finds that, for instance, mercuric sublimate actually deposits by sublimation upon the medium containing the microbes, and thus kills them, for mere mechanical wiping of the plate permits the bacteria to grow unhindered.—B. C.

2094. *A Study of the Combined Action of X-Rays and of Vital Stains upon Paramoecia.* W. M. BALDWIN. Biol. Bull., Bost., 1921, 39, 59-66.

The author used a considerable number of the so-called vital stains in a study of their effect upon paramoecia. A study was also made of the effect of X-rays upon unstained and vitally stained paramoecia. From 60 to 80 milliamperes minutes were necessary to stop the activity of unstained paramoecia while paramoecia which had been stained with trypan blue required from 5 to 10 milliamperes minutes. The susceptibility of the organism therefore to X-rays was greatly increased by the absorption of vital stains. In every case it was observed that during life, vital stains never entered the nucleus but that when the stained paramoecia died the stain entered the nucleus. "It would appear as if the nuclear membrane were normally impervious to the colloid stain until the degree of concentration of the stain in the cytoplasm became great enough to overcome this resistance. One might assume that X-rays alter this permeability thus permitting the stains to diffuse readily into the nucleus. Solutions of trypan blue, trypan red, neutral red, and dahlia when exposed to X-ray energy are not fluorescent nor is there a loss of color reaction of solutions from prolonged exposure to the rays."—R. E. B.

## WATER AND SEWAGE BACTERIOLOGY

2095. *A State Law Regulating the Construction and Maintenance of Privies.* K. E. MILLER. South M. J., Birmingham, 1920, 13, 712-715.

A statement of the fundamental features of the law as adopted by North Carolina with a report of the beneficial results.—J. H. B.

## FOOD BACTERIOLOGY

(See also Numbers 1932, 2258)

2096. *Recovery of Streptococcus hemolyticus from Restaurant Tableware.* CLARENCE C. SAELOHOF AND W. J. R. HEINEKAMP. Am. J. Pub. Health, 1920, 10, 704-707.

Restaurant tableware, including spoons, knives, forks, butter-dishes, glasses and plates were examined for bacterial flora. Swabs from the articles were smeared over neutral blood agar plates, incubated at 37°C. for 24 hours and the cultures examined macroscopically and microscopically. Of a total of 63 examinations hemolytic streptococci were isolated 4 times; pneumococcus once; *B. coli* once; *Staphylococcus aureus* twice and *albus* 31 times; *B. subtilis*, 23 times. The strains of hemolytic streptococci were found to be virulent for rabbits. The authors recommend more thorough washing and scouring of dishes and utensils; treatment with live steam; drying in hot ovens; stacking in covered containers; washing of floors and fixtures with a strong germicide; and very careful examination of restaurant employees.—I. S. F.

2097. *Oeufs granulés, comprimés d'oeufs, poudres d'oeufs. (Desiccated Eggs as Granules, Compressed Tablets and Powdered.)* MARCADIER AND GOUJON. Ann. des falsifications, Par., 1920, 13, 96-97.

Sterility of eggs is not absolute and putrefaction is possible. Gayen found that many kinds of bacteria, yeasts and mold spores may be found in eggs and further studies have shown that these may be of the most dangerous types. Numerous studies of dried egg products show that these contain in the neighborhood of 10,000 aerobes per gram. *Penicillium glaucum* appeared invariably and there was constantly an organism which produced round fluorescent colonies. It is non-spore-bearing, slightly motile, and forms a pellicle on broth with no turbidity; grows well at 21-25°C. They believe this to be the *Bacillus viridis pallescens*. The authors hold that the desiccation incident to drying the egg does not kill all the germs and those remaining are sufficient to produce changes. For this reason dried eggs should not be shipped far from the point of production and manufacturers should be required to place the date of preparation on their product.—E. L.

2098. *Gâteaux à la crème et bacilles paratyphiques B. (Cream Cakes and Paratyphoid B Bacilli.)* E. LESNÉ, H. VIOLE AND J. LANGLE. Presse méd. Par., 1920, 28, 725.

An epidemic of food-poisoning following the eating of cakes containing cream from a certain confectioner. Among the 28 cases were the confectioner himself and two members of his household. The cakes had stood 24 hours out of sunlight. There was isolated from them an organism resembling *B. paratyphosus* B, but failing to ferment maltose. It agglutinated in a specific paratyphoid B serum and in that of three cases. Nothing in the paper establishes definitely the nature of this organism. It was not differentiated from *B. suis*, and, in fact, agglutinated to a partial titre of a *B. enteritidis* serum. Mice fed on the cakes succumbed in a few hours; the organism was isolated from their dejecta and organs.

The clinical symptoms were those of an acute intoxication. While the authors failed to get positive blood or urine cultures in three cases, they quote positive results by Netter. Atypical paratyphoid B bacilli were recovered from the feces of the three cases under the authors' observation. The serum of these three cases agglutinated *B. paratyphosus* B 1-1000 three weeks after infection. There were no fatalities. Adults ran a milder course. There were no secondary cases.

Among the confectioners, there was no history of enteric fever, and the agglutination reactions with *B. paratyphosus* B were negative. Feces were not examined. Duck eggs were used in preparing the cream for the cakes. The establishment of prophylactic measures is discussed.—L. A. K.

2099. *The Possible Pathogenicity of Bacillus botulinus.* R. B. EDMONSON, L. T. GILTNER AND C. THOM. Arch. Int. Med., Chicago, 1920, 28, 357-366.

These experiments were made with two types of *B. botulinus*, Type A (Boise strain) and Type B (Nevin strain). The washed, toxin-free spores can cause death with typical symptoms of botulism regularly when injected with calcium chloride and irregularly when injected alone. Washed spores of both types of this organism are capable of causing death when introduced into the digestive tract in sufficiently large quantities. The authors conclude that foods suspected of containing *B. botulinus* should be destroyed and not heated and eaten.—G. H. R.

**2100. Giftige gewordene Nahrungs- und Futtermittel (Sauerfutter, Treber).** (*Foods and Feeds Which Become Poisonous (Silage, "Treber").*) W. HENNEBERG. *Ztschr. f. Spiritusind.* Berl., 1920, **43**, 59-61.

A review is given of knowledge concerning *Bacillus botulinus*, the colon and intermediate groups, and the *Proteus* groups in food poisoning in man. No new points are developed. Particular attention is called to the occurrence of poisoning of farm animals occasionally which have been fed on distillery wastes. A number of such examples are discussed in which the types of organisms present were determined. It is believed that organisms of the *Proteus* group are most significant in producing this poisoning.—R. E. B.

**2101. Der Abbau der Eiweisskörper einiger Milcharten in den gebräuchlichsten Genussformen durch Pepsinsalzsäure und Pankreatin, unter Berücksichtigung von Elektrolyt- und Nicht-elektrolytzusätzen.** (*The Breaking Down of the Protein of Certain Kinds of Milk in the Forms Most Frequently Used by Means of Pepsin-Hydrochloric Acid and Pankreatin, with Respect to the Addition of Electrolytes and Non-electrolytes.*) ALEXANDER GABATHULER. *Fermentforsch.*, Leipz., 1920, **3**, 18-192.

A portion of the paper is given over to the consideration of the influence of bacteria on the digestion of milk proteins by means of pepsin-hydrochloric acid. It is concluded that the bacteria of kefir fermentation facilitate the splitting of the protein by pepsin-hydrochloric acid. However, the splitting does not reach the limit secured in the investigation of the corresponding raw milk. The proportion of filterable nitrogen to the total nitrogen after 24 hours' activity of pepsin-hydrochloric acid is greater in the raw milk. It is diminished by pasteurization, it is further decreased by the activity of living kefir bacteria and sinks to half its value in milk which has been pasteurized and to which the bacteria have been added. The splitting of the protein in already fermented kefir is somewhat better.

The living bacteria of the yoghurt fermentation are able quite definitely to increase the peptic splitting of the milk protein. Indeed, the splitting goes even beyond that of the raw milk. The proportion of filterable nitrogen after 24 hours' action of pepsin-hydrochloric acid is greatest in the raw milk and least in that to which living yoghurt bacteria have been added. The acidity of the filtrate is conversely proportional to the amount of filterable nitrogen.—R. E. B.

**2102. Bacteria in Soft Drinks.** LOUIS GERSHENFELD. *Am. Food J.*, 1920, **15**, 16.

The author states that analyses of bacterial content of soft drinks quickly reveal unhygienic conditions prevailing at time of manufacture of the particular preparation. The author examined 15 brands of soft drinks, these representing the finished product as sent from the plants of various manufacturers and not those allowed to incubate at room temperatures of retail stores. Of the 15, 6 contained *B. coli* in 10 cc. quantities; 2 gave counts of less than 100; 3 less than 300; 3 between 500 and 1000 and 7 over 1000 per cubic centimeter on agar at 37°C. after 48 hours' incubation. Counts made on agar at 20°C. were higher in most cases.

Organisms found in addition to *B. coli* were staphylococci, short and long chain streptococci, *B. welchii*, *B. cloacae*, *B. subtilis*, *B. mycoides*, *B. vulgatus*, diptheroids, streptothrices and molds.

The author believes as a result of his analyses that more attention should be given to the sanitary aspect of this whole problem.—E. L.

## HEALTH BOARD LABORATORY METHODS

**2103. A Comparison of Three Methods of Examining Sputa for *B. tuberculosis*.** LLOYD R. JONES. *J. Lab. & Clin. M.*, St. Louis, 1920, **6**, 41-44.

The three methods compared were: the direct smear, the antiformin method, and smears from coagulated sputum after subjection to steam at 15 pounds pressure for 15 minutes. A total of 153 examinations by the direct method gave 3 negatives, of 170 by the antiformin method gave 8 negatives and of 170 by the autoclave method gave 2 negatives.—F. W. H.

**2104. A Dropping Bottle as an Aid in Macroscopic Slide Agglutination.** CHARLES KRUMWIEDE. *J. Immunol.*, Balt. & Cambridge, Eng., 1920, **5**, 155-157.

A dropping bottle devised by the writer has the advantage over the platinum loop in placing on the slide drops of diluting agglutinating serum where there are a large number of tests to be made as the ordinary platinum loop method is time consuming. The dropping bottle depends upon the use of a capillary delivery tube with a flat end and a rubber diaphragm to force the delivery of the drop. The diaphragm is made from a so-called "no air" stopper size No. 2½. The cork end is cut off leaving only sufficient to give stability to the delivery tube which is thrust through the cork. A ½ ounce wide mouth homeopathic vial is employed. The neck of the bottle must be wider than the cork portion of the stopper to allow up and down play otherwise there will be no diaphragm action.—R. R. H.

**2105. Beitrag zur Kenntnis der Bakterienflora einiger Arzneimittel.** (*Contribution to the Knowledge on the Bacterial Flora of Certain Drugs.*) L. M. LANSBERG. *Centralbl. f. Bakteriologie* (etc.), Jena, 2. Abt., 1920, **61**, 280-286.

The bacterial content and the bactericidal properties of a number of medicinal preparations are reported.—S. A. W.



## DIATHETIC AND DEFICIENCY DISEASES

**2106. Pellagra in the Mountains of Yancey County, North Carolina.** G. A. WHEELER. Pub. Health Rep., Wash., 1920, **35**, 2509-2514.

Six cases of pellagra occurring at an altitude of 3000 feet are described. They showed about the same clinical course and were of about the severity of cases occurring in lower altitudes. In several of the cases there was no history of association with other pellagrins, and indications of a restricted diet including little or no milk or meat were manifest.—I. A. B.

**2107. A Study of the Relation of Family Income and other Economic Factors to Pellagra Incidence in Seven Cotton-mill Villages of South Carolina in 1918.** JOSEPH GOLDBERGER, G. A. WHEELER AND EDGAR SYDENSTRICKER. Pub. Health Rep., Wash., 1920, **35**, 2673-2714.

The results of a statistical study showed that pellagra incidence varied inversely as the family income, the inverse correlation between high pellagra incidence and low income depending on the unfavorable effect of low income on the character of the household diet. Improvement in food availability (particularly of milk and fresh meat) is needed in localities having a high pellagra incidence.—I. A. B.

**2108. Frequent Causes and the Treatment of Perennial Hay-Fever.** I. CHANDLER WALKER. J. Am. M. Ass., Chicago, 1920, **75**, 782.

Perennial hay fever is frequently caused by animal emanations. Cutaneous tests should be made with common animal epidermal proteins. Patients suffering from hay fever caused by exposure to horses may be successfully treated by repeated inoculation in gradually increasing amounts of the particular epidermal portion to which they are most sensitive. Patients sensitive to cat hair may be treated similarly. Hay fever caused by epidermal proteins of animals is best prevented by avoiding the particular animal. Perennial hay fever is frequently contracted by ingestion of foods and inhalation of cereal grain flours. This is proved by cutaneous tests. Pollen hay fever is treated with the particular pollen.—P. G. H.

## CANCER RESEARCH

(See also Numbers 1998, 2138, 2321)

**2109. Histological Changes of the Different Types of Carcinoma after Exposure to Radium Rays.** NICHOLAS M. ALTER. J. Med. Research, Bost., 1920, **41**, 439-456.

Seven hundred and fifty specimens, including a great variety of carcinomata and sarcomata, were available for studying the response of different types of malignant disease to radium rays.

Different types of carcinoma show characteristically different behavior towards the rays of radium. The behavior depends mainly on the state of differentiation of the different types of carcinoma. The more undifferentiated and embryonic in type the carcinoma is, the more effective is the action of radium rays upon it. On the differentiated types, the rays of radium have a hastening effect. If the effect of these rays is proportional to the absorbed amount, the nuclei and protoplasm of different types of carcinoma and benign tissue absorb different amounts of the rays.

Eighteen photomicrographs in three plates illustrate the paper.—A. C. E.

**2110. On Glandular Adipose Tissue and its Relation to other Endocrine Organs and to the Vitamine Problem.** W. CRAMER. Brit. J. Exper. Pathol., Lond., 1920, **1**, 184.

In all types of mammals investigated there exists a glandular type of adipose tissue histogenetically distinct from ordinary adipose tissue. It has been described under various names—"brown fat," etc. It has in all embryos a characteristic gland-like structure, and this structure is retained in some adults (hibernating animals, etc.). In most species it acquires the appearance of ordinary adipose tissue soon after birth. This tissue, which is very vascular, is functionally distinct from ordinary adipose tissue. Its fatty material is rich in cholesterolin compounds and other liquids in addition to true fat. This load of lipoids is retained under conditions which determine the disappearance of ordinary adipose tissue. It is functionally related to the thyroid and adrenal glands. A close relationship exists between the lipoids of this tissue and those of the adrenal cortex. The significance of the changes of the lipoids in the adrenal cortex is discussed and the interdependence of the cortex and medulla for normal functioning. If vitamins are completely withheld the lipoids disappear from the adrenal cortex and from this tissue, but it persists as a tissue and appears as a very vascular endocrine organ. Disturbance of the functional activity of this tissue will have to be considered in connection with deficiency diseases. It is proposed to call this tissue the "lipoid gland" or the "cholesterin gland."—W. H. W.

**2111. Recherches sur de carcinome spiropterien de la souris blanche et sur sa transplantabilité.** (Research Concerning the Spiroptera Carcinoma of the White Mouse and upon its Transplantability.) J. FIBIGER. Compt. rend. Soc. de biol., Par., 1920, **83**, 1160.

Spiroptera carcinoma metastasizes and can be transplanted. The parasite is responsible, perhaps through some toxic secretion, only for the initial development of the tumor; in its growth or its metastasis the worm plays no part.—W. H. W.

2112. *Production expérimentale du cancer du goudron chez la souris blanche. (Experimental Production of Coal-Tar Cancer in White Mice.)* J. FIBIGER AND F. BANG. *Compt. rend. Soc. de biol., Par.*, 1920, 83, 1157.

Among 15 mice painted every second or third day with coal-tar, 6 survived for 257 days or more; the longest period was 331 days. Five of these mice developed carcinoma and one a transplantable carcinosarcoma. In 3 of the 6, the tumors continued to grow after the applications had been discontinued. In 2 there were metastases in the axillary lymph-nodes.—W. H. W.

2113. *Sur le rôle du facteur "race" dans la transmission du cancer chez le rat. (The Rôle of the "Race" Factor in the Transmission of Cancer in the Rat.)* A. H. ROFFO. *Compt. rend. Soc. de biol., Par.*, 1920, 83, 968.

Insusceptible races crossed with susceptible ones, produce a progeny susceptible to tumor implantation.—W. H. W.

2114. *Die Entstehung von Granulationsgeschwülsten und Adenomen, Karzinom, u. Sarkom durch die Larve der Nematode Rhabditis pellio. (The Production of Granuloma, Adenoma, Carcinoma and Sarcoma by the Larvae of the Nematode Rhabditis pellio.)* FR. KOPSCHE. G. THIERME, Leipzig, 1919.

A monograph with 121 pages of text and 107 colored illustrations. The nematode larvae form encapsulated cysts in the tissues, and give rise in some cases to benign or malignant tumors.—W. H. W.

2115. *The Oxygen Consumption of Normal and Cancerous Mouse Tissues in vitro.* B. R. G. RUSSELL AND W. E. GYE. *Brit. J. Exper. Pathol., Lond.*, 1920, 1, 175.

This paper contains an account of an investigation of the oxygen absorption of normal and malignant mouse tissues. The method of estimating the oxygen requirement of tissues has consisted chiefly in suspending the finely minced tissue in defibrinated rabbit blood, incubating at 37.5°C., and determining the oxygen content of the blood with a Barcroft differential blood-gas manometer. In two experiments mouse blood has been used.

Of the normal tissues kidney is found to consume most oxygen, testis and embryo least. It would appear from the figures obtained for the different normal tissues tested that function is continued for a time after the tissues have been minced.

Malignant cells take up approximately the same amount of oxygen as the corresponding normal tissue cells. It is tentatively concluded that the oxygen consumption of malignant cells rises with increasing speed of growth, and further, that more oxygen is used by tumors which are more highly differentiated histologically.—W. H. W.

2116. *The Respiratory Exchange of Surviving Mouse Tissues, Normal and Neoplastic.* B. R. G. RUSSELL AND W. H. WOOLOM. *Brit. J. Exper. Path., Lond.*, 1920, 1, 244.

An examination of the respiratory quotients, obtained by suspending tissue emulsions in alveolar air in the Bancroft blood-gas apparatus, suggests that rapidly growing, undifferentiated tumors draw their energy from carbohydrates, while slowly growing neoplasms appear to draw upon the fats.—W. H. W.

2117. *Discussion on the Present Position of Cancer Research: Opening Paper.* J. A. MURRAY. *Brit. Med. J., Lond.*, 1920, 2, 653.

Cancer appears to be due to a biological alteration in the cell, the nature of which it is difficult to discover because our knowledge of normal cell life is still so incomplete.—W. H. W.

2118. *Discussion of the Present Position of Cancer Research.* H. J. CAMPBELL. *Brit. Med. J., Lond.*, 1920, 2, 655.

The occurrence of carcinoma is best explained as an abortive attempt of the organism to reproduce itself asexually.—W. H. W.

2119. *Discussion of the Present Position of Cancer Research.* J. C. MOTTRAM. *Brit. Med. J., Lond.*, 1920, 2, 655.

Because of the many features possessed in common by natural and induced resistance, it is by no means certain that even spontaneous cancers will not respond to a more powerful induced resistance, if such can be elicited.—W. H. W.

2120. *Discussion on the Present Position of Cancer Research.* SIDNEY RUSS. *Brit. Med. J., Lond.*, 1920, 2, 656.

The lymphocyte appears to be significant in cancer immunity, though perhaps it must be brought into the neighborhood of the tumor in order to be effective. Immunity to spontaneous tumors varies only in degree from immunity to transplanted new growths. It does not differ in kind.—W. H. W.

2121. *Discussion on the Present Position of Cancer Research.* A. LEITCH. *Brit. Med. J., Lond.*, 1920, 2, 656.

None of the sero-diagnostic methods so far proposed has been found reliable, nor has any method of therapeutic attack been found other than surgery. This, however, must be based on sound pathology if the best results are to accrue.—W. H. W.

**2122. Discussion on the Present Position of Cancer Research.** J. G. ADAMI. Brit. Med. J., Lond., 1920, 2, 658.

To explain cancerous growth the speaker predicated a stimulation which sets up in the cells a habit of growth.—W. H. W.

**2123. Discussion on the Present Position of Cancer Research.** S. FLEXNER. Brit. Med. J., Lond., 1920, 2, 658.

Murphy's work shows that a definite relation can be demonstrated between lymphocytosis and cancer immunity.—W. H. W.

**2124. Kinship of Albumins in Cancer and in Blood Stream.** LEOPER et al. Progrès méd., Par., 1920, 35, 355. Abstr. in J. A. M. A., 1920, 75, 1234.

Albumin in the blood serum was found unusually high in cancer patients, and injection of guinea pigs with this albumin induced anaphylaxis for the albumin in the cancer.—W. H. W.

**2125. Production of Tumors in the Absence of Parasites.** E. F. SMITH. Arc. Dermatol. & Syph., 1920, 2, 176 (Abstr. in J. A. M. A., 1920, 75, 632).

The author has produced hyperplasias: (1) By the application of acids and alkalies to susceptible plants; (2) by the introduction into plants of certain organisms (especially the crown-gall bacterium); (3) by limiting the amount of oxygen taken in by the plant, thus compelling its cells to rearrange their protoplasm and divide at once, or perish. The acidity of the tissues is increased in plants so treated.—W. H. W.

**2126. Bladder Tumors in Dye Workers.** H. CURSCHMANN. Zentralbl. f. Gewerbehyg., Berl., 1920, 8, 169. (Abstr. in J. Am. M. Ass., 1920, 75, 1301.)

The data show that, since 1913, 28 cases of bladder tumors have been encountered among workers in the chemical industries, and the list includes 15 malignant tumors. This brings to about 200 the total number of cases in 80,000 to 100,000 persons employed in the manufacture or handling of chemicals, especially anilin dyes. Dyes with aromatic bases and beta naphthylamin seem to be generally incriminated. Since 1905, improvements have been made in the care of workers, the benefit of which is seen in the drop to 28 cases in 7 years. Years of contact (10 to 30) are necessary to develop bladder tumors.—W. H. W.

**2127. Bladder Tumors in Dye Workers:** SCWHERIN. Zentralbl. f. Gewerbehyg., Berl., 1920, 8, 64. (Abstr. in J. Am. M. Ass., 1920, 75, 1383.)

In 79 out of 100 cases of bladder tumor, the chemical involved was fuchsin (rubin), benzidin, or naphthylamin. The average time was 12 to 19 years with fuchsin (rubin); 6 years with benzidin group, and 8 years with naphthylamin.—W. H. W.

#### DISEASES OF THE BLOOD, LYMPHATICS AND DUCTLESS GLANDS

**2128. Ueber akute Leukämie. (Acute Leukemia.)** CARL STERNBERG. Wien. klin. Wchnschr., 1920, 33, 553-557.

There is no such thing as an acute form of chronic myeloid leukemia or of chronic lymphatic leukemia. The symptom-complex known as acute leukemia is no genuine leukemia but a general infection with a leukemoid blood picture and a corresponding reaction of the hematopoietic apparatus. Why organisms that ordinarily produce a general septic condition should occasionally call forth symptoms of an acute leukemia is still a question.—B. C.

**2129. Bubonic Plague.** M. D. LEVY AND DRU McMICKEN. Texas State J. M., Fort Worth, 1920, 16, 195-200.

The authors report their experience with the plague situation in Galveston and Beaumont. They detail the symptomatology of the disease and discuss its dissemination by rats. They report favorable results from the use of anti-plague serum, only two of the ten receiving the serum having died. One of the fatal cases died with septicemic symptoms 14 hours after the initial dose. The other death followed a meningitic involvement and occurred in spite of 780 cc. of serum intravenously and 35 cc. intraspinally. They advise larger dosage in those showing axillary buboes.—J. H. B.

#### DISEASES OF THE CIRCULATORY SYSTEM

**2130. Syphilis of the Heart and Aorta.** I. I. LEMANN AND A. MATTES. South. M. J., Birmingham, 1920, 13, 623-626.

In a study of 100 consecutive autopsies the heart and aorta were studied. The bodies were of both sexes, white and black and ranged in age from 6 days to 85 years. Only 9 of the aortas were normal macroscopically and of these, 3 presented the histologic picture of syphilis. Only 1 adult aorta was normal. There were 3 aneurysms in the series. When studied histologically 55 of the 100 aortas presented changes which have been described as pathognomonic of syphilis. Spirochetes were found in 2 aortas. Of the 55 cases 8 showed evidence of syphilis elsewhere in the body, 47 showed no other evidence. Fourteen gave a history of an

initial lesion; 19 denied an initial lesion; 22 gave no history of an initial lesion. Five gave a positive Wassermann before death; 11 gave a negative Wassermann, and in 39 cases no Wassermann was recorded. Twenty-seven had given evidence of cardio-vascular disease while in hospital while 28 had given no such evidence. The hearts of the 55 cases showing aortic lesions were histologically normal in only 16 instances.—J. H. B.

## DISEASES OF THE DIGESTIVE SYSTEM

(See also Numbers 2011, 2085, 2088, 2239, 2244, 2314)

**2131. Notes on the Flora of the Stomach.** G. E. BURGET. *J. Bact.*, Balt., 1920, 5, 299-303.

Bacteriological examination of the psychic secretion from a patient with a gastric fistula showed that when the acidity was normal relatively few bacteria were able to resist the HCl. If the acidity were below normal quite a variety of organisms were contained. The counts of some 20 specimens (glucose litmus agar plates) varied from 25,000 to 100,000. Only one of the organisms met with (a yeast) showed appreciable resistance to the acid of the gastric juice.—I. S. F.

**2132. Intestinal Obstruction. A Study of the Influence of the Bacterial Flora on the Toxemia of Acute Obstruction.** P. R. CANNON, L. R. DRAGSTEDT AND C. A. DRAGSTEDT. *J. Infect. Dis.*, Chicago, 1920, 27, 139-144.

The intestinal bacterial flora of white rats was changed by modifying the diet. The feeding of a high protein diet was associated with a predominance of proteolytic bacteria, while the addition of lactose or dextrin to the food was followed by the predominance of aciduric organisms in the intestine, as Hull and Rettger have shown. The effects of intestinal obstruction in the presence of proteolytic or aciduric bacteria were studied.

A complete obstruction of the distal end of the cecum was made in each rat, either by cutting the bowel, infolding and closing both distal and proximal ends or by ligation with silk tape.

It was found that the toxemia incident upon acute intestinal obstruction was always associated with the predominance of proteolytic bacteria above the obstruction. After obstruction, an original aciduric flora was supplanted by proteolytic organisms, although the food contained lactose.

Although it was not possible to prevent toxemia in acute intestinal obstruction by inducing through carbohydrate diet a predominantly aciduric flora, the onset was delayed in proportion to the degree of maintenance of an aciduric flora.—S. B-J.

**2133. Irregular Typhoid Strains.** K. F. MEYER AND N. M. NEILSEN. *J. Infect. Dis.*, Chicago, 1920, 27, 46-71.

This report describes the laboratory infections in a vaccinated caretaker exposed to animals excreting living typhoid bacilli and in a laboratory worker also immunized who was working with strains of the typhoid group. From the blood of case 1 and the urine of case 2 an irregular atypical organism was isolated. A fatal contact infection was apparently attributable to case 2, and from the stool and urine of this fatal case typical *B. typhosus* was isolated. The irregular typhoid strains fermented without gas glucose, levulose, galactose, mannose, mannit, maltose, xylose, dextrin, arabinose, dulcitol and rhamnose. In formalized killed suspensions they were agglutinated only by homologous serums and an antiserum to *B. enteritidis*. But suspensions of the living organisms were agglutinated by antityphoid serum. Antiserums to these organisms agglutinated typhoid bacilli in living suspensions only. They resemble non-gas producing strains of *B. enteritidis*.

It is supposed by the authors that these irregular strains are mutants of *B. typhosus* which changed in its passage through the tissues of immunized animals.—S. B-J.

**2134. Once a Typhoid Carrier, Always a Typhoid Carrier.** S. H. OSBORN AND E. A. BECKER. *J. Infect. Dis.*, Chicago, 1920, 27, 145-150.

This is the report of a survey conducted in Massachusetts since 1917 to search for typhoid carriers. A table summarizes the data on 51 typhoid carriers found in the state. These carriers were apparently responsible for 493 cases of typhoid fever, many of them being engaged in the handling of foods. Several persons were found to be carriers of typhoid bacilli 20 to 45 years after they had recovered from typhoid fever. The axiom "once a typhoid carrier, always a typhoid carrier" is recommended for the guidance of health officials.—S. B-J.

**2135. Ueber seltenerer Eiterungen nach Paratyphus. (Uncommon Suppurations following Paratyphoid Fever.)** M. MARTENS. *Berl. klin. Wchnschr.*, 1920, 57, 296-298.

Quite similarly as in typhoid fever, suppurations occur after paratyphoid—often after a long interval—caused by paratyphoid bacilli, mostly of type B, less so by type A, partly in combination with other bacteria.—B. C.

**2136. Ueber die klinisch-biologische Bewertung atypischer Zustands- und Fieberbilder der Infektionskrankheiten. (The Clinical and Biological Significance of Atypical Condition and Fever Pictures in Infectious Diseases.)** H. OELLER. *Deutsche med. Wchnschr.*, Berl. & Leipz., 1920, 46, 850-852.

Analysis of the fever curve in typhoid (and other specific febrile diseases) does not yield satisfactory immunological data because the curve is a composite one. On the other hand, the

fever curve in atypical typhoid cases in persons who have previously been subjected to protective inoculation shows distinct periodical rises and recessions 5 to 6 days apart. Such atypical undulatory or paroxysmal typhoid curves are really representative of the usual typhoid curve except that they are subdivided into single successive wave-like (protective?) reactions because of a more potent immunity mechanism.—B. C.

2137. *Zur Pathologie und Klinik der Paratyphus-B Infektion. (Pathology and Clinical Symptoms of Paratyphoid B Infection.)* RICHARD BAUER. Wien. klin. Wchnschr., 1920, 33, 575-578.

The numerous possibilities for localization of paratyphoid B infection in the liver are pointed out and their relations to the resultant symptoms indicated. A case is described in detail together with subsequent autopsy findings.—B. C.

2138. *Ueber die entzündlichen Dickdarmgeschwülste. (Inflammatory Swellings in the Large Intestine.)* P. SUDECK. Berl. klin. Wchnschr., 1920, 57, 416-418.

The large intestine is often the seat of localized, tumor-like inflammations (colitis and pericolitis) which may be mistaken for carcinoma. Radical treatment has proven successful in such cases.—B. C.

2139. *Ueber Typhlitis. (Typhlitis.)* TH. FAHR. Berl. klin. Wchnschr., 1920, 57, 413-416.

Chronic inflammation of the cecum is a frequent occurrence, often in conjunction with a chronic appendicitis, and due to stenosis. Clinical details of such cases are given.—B. C.

#### DISEASES OF THE GENITO-URINARY SYSTEM

(See also Numbers 1962, 1967, 2082, 2091, 2181, 2250, 2260, 2261, 2297, 2300, 2303, 2306)

2140. *Das Behandlungsmass der rezenten Lues. (Evaluation of the Treatment of Early Syphilis.)* ALFRED BRANDWEINER. Wein. klin. Wchnschr., 1920, 33, 558-562; 583-587; 608-610.

In genuine primary cases of early syphilis it appears that 25 to 30 doses of neosalvarsan are required to effect cure (simultaneous local treatment with mercury is of course not to be omitted). Such a system leads to overtreatment but is to be preferred to the greater evil of latent syphilis.—B. C.

2141. *Ueber die Indikationen zur Salvarsanbehandlung der Syphilis und die Behandlung mit Silbersalvarsan. (Indications for the Treatment of Syphilis with Salvarsan and with Silver Salvarsan.)* W. SCHOLTZ. Deutsche med. Wchnschr., Berl. & Leipz., 1920, 46, 879-881.

In the early stages of syphilis especially, combined mercury and salvarsan therapy leads to rapid cure. To make sure of the result, one or two treatments are to be given after 6-week intervals.

Silver salvarsan does not appear to represent an improvement over salvarsan in the treatment of syphilis, and exaggerated hopes for its efficacy are warned against.—B. C.

2142. *Changes in Acidity or Alkalinity of the Urine Produced by B. coli as Measured by the Final Hydrogen Ion Concentration.* A. T. SHOHL. J. Urol., Balt., 1920, 4, 371-378.

In an investigation to determine the effect on the reaction of urine or bouillon by cultures of *B. coli* it was found that a definite final alkaline reaction of pH 8.0 was always obtained regardless of the initial reaction.—R. D. H.

2143. *A Hemophilic Anaerogenic Paracolon Bacillus Found in a Case of Infected Bilateral Hydronephrosis.* K. F. MEYER AND F. HINMAN. J. Infect. Dis., Chicago, 1920, 27, 72-81.

A bacillus isolated from the urine of a case of infected hydronephrosis is described. At first, it grew as a "parasitic Gram-negative capsulated strain" only on media containing hemoglobin. The bacillus is apparently a member of the paracolon group, and is designated as a hemophilic nonaerogenic paracolon bacillus. After 4 months' cultivation artificially it acquired the property of growing on hemoglobin free media, and fermented without gas formation the following carbohydrates: hexoses, maltose, rhamnose, xylose, mannitol, arabinose and sorbitol. Indol formation was variable.

After the patient had been treated with a vaccine composed of "heat-killed tricresolized" bacterial suspensions of the original parasitic strain, there was a recrudescence of symptoms. Cultures from the urine at the time yielded an organism similar in every respect to the "saprophytic" strain obtained by long cultivation on artificial media.—S. B-J.

2144. *A propos de la blennorrhagie gonococcique chez l'homme, la femme et la fillette. (Gonorrheal Urethritis in the Male and in the Adult and Infant Female.)* DIND. Schweiz. med. Wchnschr., 1920, No. 38, 833-838.

The use of silver nitrate is advocated. Complement fixation tests show marked variations in a single case from day to day and consequently are of questionable value from a diagnostic point of view, or as indicating antibody response on the part of the patient. Vaccine or serum therapy is of little practical value.—G. H. S.

2145. *Zur Frage der Gonorrhoebehandlung beim Weibe.* (*The Treatment of Gonorrhea in the Female.*) GRAEBKE. Deutsche med. Wchnschr., Berl. & Leipz., 1920, 46, 941-942.

In addition to local treatment with silver preparations, intravenous injections of collargol are recommended as very effective in overcoming even an extensive infection. However, it is recognized that not all cases can be cured in this manner.—B. C.

2146. *Idiopathic Gangrene of the Scrotum.* A. RANDALL. J. Urol., Balt., 1920, 4, 219-236.

A typical case of this rather unusual condition is cited with a review of 16 previous cases in the Philadelphia General Hospital.

The belief is expressed that the condition is always due to an infectious agent with the pathology that of a lymphangitis. Both aerogenic and non-gas producing types are found, the streptococcus being the most common organism found in the latter.—R. D. H.

## DISEASES OF THE LOCOMOTOR SYSTEM

(See Numbers 2220, 2279)

## DISEASES OF THE NERVOUS SYSTEM

(See also Numbers 1942, 1969, 2256, 2278)

2147. *Indol Test on the Spinal Fluid for Rapid Diagnosis of Influenzal Meningitis.* T. M. RIVERS. J. Am. M. Ass., Chicago, 1920, 75, 1495.

The author found that 11 out of 12 meningitic strains of *B. influenzae* formed indol. An indol test therefore is a valuable aid in rapid diagnosis of influenzal meningitis.—P. G. H.

2148. *The Precipitin Test for Globulin in the Arachnoid Fluid in General Paralysis.* LUDVIG HEKTOEN AND CLARENCE A. NEYMANN. J. Am. M. Ass., Chicago, 1920, 76, 1332.

A definite index of the amount of protein in arachnoid fluid is obtained by preparing various dilutions and adding antihuman rabbit serum. Using an antihuman serum of a titer of 1000 the authors found that normal arachnoid fluid caused a precipitate in a dilution of 1:3.7. Arachnoid fluid from general paralysis caused a precipitate in a dilution of 1:12.6. By studying arachnoid fluids from general paralysis, epilepsy, insanity, epidemic poliomyelitis, normal persons, etc. it was found that in general paralysis albumin and globulin are increased, chiefly the globulins. In the fluid of epilepsy the increase is in the albumin. Antiglobulin serum prepared by injections of human globulin or of paralytic arachnoid fluids have caused precipitates in paralytic fluids diluted from 16 to 512 times and even higher. In fluids from other sources precipitates were caused in dilutions of 2 to 8 or 16 times. The test is well adapted for routine work on account of its simplicity.—P. G. H.

2149. *The Cerebro-Spinal Fluid in Syphilis.* J. H. BLACK. Texas State J. M., 1920, 16, 174-176.

A brief survey of the recent literature bearing particularly upon the question of the earliest time at which infection of the nervous system may occur and the criteria by which a cure of the infection may be determined.—J. H. B.

2150. *Beitrag zur Therapie der multiplen Sklerose mit Silbersalvarsan.* (*Therapy of Disseminated Sclerosis with Silver Salvarsan.*) LUDWIG STERN-PIPER. München. med. Wchnschr., 1920, 67, 985-986.

Several cases are described which responded favorably to treatment with silver salvarsan.—B. C.

2151. *Serologische Studien zum Paralyseproblem.* (*Serological Studies in General Paralysis.*) V. KAFKA. München. med. Wchnschr., 1290, 67, 955-957.

The serological aspects of late syphilis are discussed. The fact that there is no marked tissue reaction in the brain invaded by spirochetes is considered significant.—B. C.

2152. *Kolloidchemische Untersuchungen am Liquor cerebrospinalis.* (*Colloid-Chemical Studies of the Cerebrospinal Fluid.*) FELIX STERN AND FRITZ POENSGEN. Berl. klin. Wchnschr., 1920, 57, 272-275; 303-306.

Substitution of Cassius gold purple for gold sol in spinal fluid examinations is not satisfactory. On the other hand, collargol, which is quite stable, gives a characteristic reaction with pathologic fluid. The reactions of the spinal fluid in a number of diseases are described in detail.—B. C.

## DISEASES OF THE RESPIRATORY SYSTEM

(Except Influenza and Tuberculosis)

(See also Numbers 1941, 2011, 2245, 2268, 2295, 2297)

2153. *Further Studies on the Types of Streptococci Found in the Sputum of Bronchial Asthmatics.* JUNE ADKINSON AND I. CHANDLER WALKER. J. Med. Research, Bost., 1920, 41, 457-466.

Strains of streptococci isolated from sputum of asthmatic patients were grouped according to Holman's classification. Streptococci were obtained from 59 of the 65 sputums exam-

ined. Hemolytic streptococci were recovered from 42, and non-hemolytic streptococci were recovered from 51 of the 65 sputums. Organisms other than streptococci were found in small numbers. There appeared to be no close correspondence between the flora of the bronchial sputum and that of the nasal passages. The types of organisms in the sputum were found to be subject to frequent variation.—A. C. E.

2154. *Certain Epidemic Micro-Organisms of the Respiratory Tract.* D. J. DAVIS. J. Am. M. Ass., Chicago, 1920, 78, 792.

In normal throats there are varieties of bacteria that may become dangerous. The most important ones of these are streptococci, pneumococci, Pfeiffer's bacillus, staphylococci, meningococci, diphtheria bacilli and diphtheroids. Possibly the viruses of measles, scarlet fever, anterior poliomyelitis and lethargic encephalitis might be included. Streptococci may be virulent or may become virulent when they gain the ability to implant on the respiratory mucosa. Some may cause epidemics. These are virulent and the term *Str. epidemicus* has been applied to them. Pneumococcus infections are frequently caused by strains occurring in the mouth (Group IV). Types I, II, etc., appear at times and may cause epidemics. The influenza epidemics of 1889-90 and 1918 were probably caused by the Mather's coccus. Pfeiffer's bacilli (hemophils) have a distribution quite like streptococci. Meningococci are commonly found in normal throats, as are also diphtheria bacilli. *B. fusiformis* is sometimes found in the respiratory tract and may be responsible for definite outbreaks. Agglutination tests are valuable for determining the presence of special strains of bacteria. There is no strict parallelism between capsule formation and virulence.—P. G. H.

### INFLUENZA

(See also Numbers 2147, 2183, 2316)

2155. *The Incidence of Streptococcus hemolyticus in a Recent Epidemic of Influenza.* HOMER L. CONNER. J. Lab. & Clin. M., St. Louis, 1920, 6, 767-775.

The author found a direct relationship between *Streptococcus hemolyticus* and the influenza epidemic.

In the pre-epidemic period the type of hemolysis was the narrow zone with marked greenish tint and the streptococci could be differentiated from pneumococci only by the bile solubility test and by agglutination. During the epidemic the zone of hemolysis was broader and lost its greenish tint but in the post-epidemic period returned to the pre-epidemic type.

On artificial cultivation colonies with the narrow green discolored hemolysis never produced wide zone hemolysis while those with zone hemolysis may continue to produce this type of hemolysis for 3 or 4 generations, but once having assumed the narrow green tinted type remain so.

The width of the zone of hemolysis depends on passage through man or animals. Streptococci producing wide zone hemolysis are virulent; the other type is the quiescent stage.—F. W. H.

2156. *Zur Frage des Influenzaerregers. (The Etiology of Influenza.)* F. NEUFELD. Deutsche med. Wehnschr., Berl. & Leipz., 1920, 46, 957-959.

After a critical survey of the literature, it is concluded that there is as yet no positive evidence for the assumption that a filterable virus is the etiological agent in influenza; and on the other hand, that the behavior of the Pfeiffer bacillus does not deviate in any important point from what we should anticipate in the causative organism of influenza.—B. C.

2157. *Influenza Studies. I. Immunity in Influenza.* E. O. JORDAN AND W. B. SHARP. J. Infect. Dis., Chicago, 1920, 26, 463-468.

Influenza epidemics occurred in January, 1920, at Camp Grant and at the Great Lakes Naval Station. A census of about 10,000 men in these stations was taken to divide the men into the groups of those attacked and those not attacked in the 1918-1919 epidemic, and to determine the number in each group attacked in the 1920 epidemic. Fifteen to 21 per cent of those giving a previous history of influenza had a repeated attack, while of those who had never had influenza, 10 to 21 per cent were attacked in 1920.

"These results indicate that no marked immunity to influenza exists 12 to 15 months after a previous attack."—S. B-J.

2158. *The Pathology of Influenza in France.* S. W. PATTERSON. M. J. Australia, Sydney, 1920, Vol. 1, No. 10, 207-210.

The pathological findings are summarized as intense inflammatory edema of the lungs; toxic degeneration of the special cells of all organs and tissues of the body; hemorrhages.

From the heart blood in 44 patients, *B. influenzae* was recovered once, pneumococcus, was twelve times, streptococcus, was once, staphylococcus, was once.—C. P. B.

2159. *"Spanska sjukan" vid Sahlgrenska sjukhuset. (Spanish Influenza at the Sahlgren Hospital.)* CARL A. WALLGREN. Hygiea, Stockholm, 1920, 82, 257-270.

A small epidemic of influenza occurred in Sweden during the summer months of 1918, which had almost subsided at the beginning of September when a period of recrudescence

ensued, which reached its peak during the middle of October. Among 1311 cases received at the Sahlgren Hospital of Gothenburg, during the period July 12 to December 31, there were 399 deaths; a death rate of 30.4 per cent. The mortality was 34 per cent among men and 29.2 per cent among women. The highest mortality occurred between the ages of 20 and 30. Lung complications occurred in 1015 cases, or 77 per cent; which large percentage is accounted for by the fact that cases developing such complications were usually hospitalized, but other cases not. The mortality among these was 38 per cent. Three of the 1015 cases involved lobar pneumonia, while all the remaining showed bronchopneumonia. Pfeiffer's bacillus was not found but the streptococcus, staphylococcus and pneumococcus were isolated from cases.—I. A. B.

§160. *Observations et recherches bacteriologiques sur la récente épidémie d' "influenza."* (Observations and Bacteriological Studies on the Recent Epidemic of Influenza.) A. MARRASINI. Arch. ital. de Biol., 1919, 69, N.s. 9, 206-214.

The author notes the isolation from the sputum of influenza patients of a considerable number of more or less hemophilic bacteria. One of these, together with its effect when injected into laboratory animals, is discussed in some detail. The organism is not named. At first, it grew only upon blood agar, but later was grown on ordinary agar. It is a Gram-negative bacillus, single or in pairs, without spores, actively motile, grows at room temperature as well as blood heat, does not ferment mannitol or lactose, but produces acid from glucose. Indol is negative. Neutral red is not changed.

Guinea pigs succumb within 4 to 24 hours to intrathoracic or intraperitoneal injection. The pathological findings are given in detail. Similar studies were made upon the rabbit. Apparently the organism affects particularly the vascular system especially of the respiratory apparatus. Sublethal doses into guinea pigs conferred a certain degree of immunity.—R. E. B.

§161. *Elektive Schädigungen des Kapillarsapparates bei Grippe und bei der sogenannten Rachitis tarda.* (Selective Damage to the Capillary System in Influenza and in So-called Rachitis Tarda.) RICHARD STEPHAN. Berl. klin. Wchnschr., 1920, 57, 437-440.

A discussion of the Rumpel-Leede phenomenon: the appearance of minute subcutaneous hemorrhages in the elbow and forearm following brief compression of the upper arm. This capillarrhexis is the result of a toxic and selective damage of the endothelium of the whole capillary system in numerous diseases, notably influenza. Following an attack of influenza this symptom remains constant, receding very gradually without variations in intensity. On the other hand, in rachitis tarda, due to inadequate nutrition, a disease which has some points in common with influenza, this symptom is inconstant and appears to indicate that the 'capillary tone' is dependent upon a central hormone regulation.—B. C.

§162. *Ueber eigenartige Restbefunde nach Grippe-pneumonie.* (Characteristic After-effects of Influenza Pneumonia.) H. STRAUSS. Berl. klin. Wchnschr., 1920, 57, 389-391.

A certain proportion of influenzal pneumonia cases follows a course of chronic pneumonia which may last for several months.—B. C.

§163. *Ursache protrahirter Lungenverdichtungen nach Grippe.* (The Cause of Protracted Lung Condensations after Influenza.) VICTOR SCHILLING. Berl. klin. Wchnschr., 1920, 57, 391-392.

X-ray pictures of the thoracic cavity of persons who have recovered from influenza show certain extended areas of shadow with dense centers which are believed to be pus foci in the septa, interstitial tissue or the bronchi.—B. C.

§164. *Ueber Enzephalomyelitis bei Grippe.* (Encephalomyelitis in Influenza.) J. E. KATSER-PETERSON. Berl. klin. Wchnschr., 1920, 57, 632-634.

Are the numerous forms of encephalitis, many described under different names, to be considered as a single disease? Is there a close relation between encephalitic infections and the influenza epidemic? These questions are discussed in the light of admittedly meagre information so far at hand. Bacteriologically, there are 2 possibilities; (1) that the influenza and encephalitis virus are identical, analogous to certain manifestations of syphilis; or (2) that it is a matter of a mixed infection whereby the influenza virus encourages the secondary infection by reducing the resistance of the organism or by activating the encephalitis virus.—B. C.

§165. *Ueber chronische Grippe.* (Chronic Influenza.) WILHELM HILDEBRANDT. München. med. Wchnschr., 1920, 67, 1008-1009.

The recent influenza pandemic was preceded by an extensive endemic incidence of influenza in 1915 and 1916. Pfeiffer's influenza bacillus seems to be the etiologic agent. The various clinical features are discussed in their relation to tuberculosis. The differentiation of tuberculosis and influenza is one of the most difficult problems in the differential diagnosis for pulmonary tuberculosis.—B. C.

§166. *Supersaninjektionen (Menthol-Eukalyptol-Berliner) bei Grippe.* (Injection of Supersan (Berliner's Menthol-Eucalyptol) in Influenza.) ARNOLD FUCHS. München. med. Wchnschr., 1920, 67, 1018-1019.

Intramuscular injection (1 to 2 cc.) of a mixture of menthol and eucalyptol seems to have a favorable influence in the course of respiratory diseases like influenza, bronchitis, etc.—B. C.



2167. *Die chemotherapeutische Behandlung der Grippe. (The Chemotherapeutic Treatment of Influenza.)* ALFRED ALEXANDER. Deutsche med. Wchnschr., Berl. & Leipz., 1920, 46, 965-966.

Influenza, especially the type with a mild onset, is considered dangerous, and prompt, vigorous treatment should be instituted to prevent complications. Optochin and eucupin are very valuable agents against streptococci and diplococci, where these invaders complicate the situation. Intramuscular injections of vuzin in the graver septic and encephalitic complications seem to have remarkable curative effect.—B. C.

2168. *Die Rolle des Vuzins bei der Grippe-bekämpfung. (The Role of Vuzin in the Influenza Campaign.)* PAUL ROSENSTEIN. Berl. klin. Wchnschr., 1920, 57, 463-467.

Vuzin, one of Morgenroth's quinine derivatives, is an excellent material for the prevention and combating of all septic conditions following influenza, especially early empyema. Even in general sepsis, it appears that intramuscular injections of vuzin plus argatoxyl (which stimulates leucocytosis) are effective in causing a recession of the symptoms.—B. C.

### ENCEPHALITIS LETHARGICA

2169. *Studies in Epidemic (Lethargic) Encephalitis. Cultural Studies.* L. LOEWE AND I. STRAUSS. J. Infect. Dis., Chicago, 1920, 27, 250-269.

By using the ascitic-fluid tissue medium of Noguchi the authors succeeded in cultivating a minute globoid organism which they regard as the parasite causing encephalitis lethargica. An essential to success in the cultivation of this parasite is the use of sterile bile-free ascitic fluid of high specific gravity (preferably from decompensated cardiac cases). Pieces of sterile rabbit's kidney were added to the fluid, and the medium after inoculation covered with a layer of sterile petrolatum, which obviates the use of a Novy jar to obtain the proper degree of anaerobiosis.

Growths of the minute globoid organism were obtained from the brain, nasopharyngeal mucous membrane, spinal fluid and blood—directly from some of the tissues and also from their Berkefeld filtrates. The same organism was recovered from the brain and pharyngeal mucous membranes of rabbits inoculated with material from human cases of encephalitis. The virus in the cultures passed through Berkefeld filters.

The cultures from the tissues and fluids were infectious for rabbits, producing encephalitis in rabbits after intraspinal inoculation. The organism was recovered from rabbits thus inoculated. Positive animal inoculations were obtained from the eleventh subculture of the organism.

Photographs are reproduced showing the morphology of the organism. The morphology, staining and cultural reactions are described in detail, with a method of isolating the organism from colonies in semisolid medium.—S. B-J.

2170. *Lethargic Encephalitis. A Report of Two Cases, with the Isolation of a Streptococcus from the Blood of One Case.* JACOB MEYER. J. Nerv. & Ment. Dis., N. Y., 1920, 52, 409-415.

This article reports the isolation from the blood of a hemolytic streptococcus with a tendency to produce green on blood agar. It is not bile soluble, does not ferment inulin nor mannite, ferments salicin and lactose and is not pathogenic when injected intravenously into rabbits and guinea pigs. The organism did not grow aerobically in the first generation but did so in the second generation.

The author also reviews the literature concerning the causation of lethargic encephalitis.—F. W. H.

2171. *Ueber sporadische und epidemische Encephalitis—sog. Encephalitis lethargica—bei Kindern. (Sporadic and Epidemic Encephalitis Lethargica in Children.)* E. WIELAND. Schweiz. med. Wchnschr., 1920, No. 28, 581-590.

A review and discussion of the recent literature on encephalitic lethargica. Particular attention is given to a possible relation between influenza and encephalitis.—G. H. S.

### TUBERCULOSIS

(See also Numbers 1944, 2103, 2205, 2246, 2247, 2248, 2249, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2302, 2315, 2319)

2172. *Twenty-four Years Experience with the Subcutaneous Tuberculin Test.* LAWRASON BROWN AND FRED H. HEISE. Am. Rev. Tuberc., Balt., 1920, 4, 254-261.

During twenty-four years 324 patients received the subcutaneous tuberculin test, it being given during the later years only to those patients without a parenchymatous X-ray pulmonary lesion. Forty-two patients failed to react to a second dose of 0.01 cc. O.T. Such patients can be safely returned home and to work. In no instance did the tuberculin produce a lasting untoward result, and in only two instances did tubercle bacilli appear in the sputum for the first time immediately after the test. Of seventy-five patients with a history of hemoptysis, over 90 per cent reacted to the tuberculin test. About 90 per cent of 144 patients with

dry pleurisy and 90 per cent of 10 patients with wet pleurisy reacted positively. Of 41 patients studied by X-ray only 3 showed a positive increase of shadows. Of 268 patients only 48 (18 per cent) showed an increase in rales during the reaction and 21 (8 per cent) a decrease. "The subcutaneous tuberculin test when positive proves tuberculosis infection, but when accompanied by definite clinical changes, or more surely if by increase of X-ray changes (focal reaction) indicates that the lesion is more accessible to circulatory changes and presumably less firmly cicatrized (healed)."—T. G. H.

**2173. Ueber Tuberkulinbehandlung mit besonderer Berücksichtigung der Intrakutanbehandlung.** (*Tuberculin Therapy with Particular Reference to the Intracutaneous Method.*) H. SAHLI. Schweiz. med. Wochschr., 1920, No. 27, 557-567.

The technic of injection, methods of regulating dosage, and results secured, in the therapeutic use of tuberculin by intracutaneous injection are presented. This method of application is considered superior to subcutaneous injection.—G. H. S.

**2174. The Influence of Creosote, Guaiacol and Related Substances on the Tubercle Bacillus and on Experimental Tuberculosis.** *Studies on the Biochemistry and Chemotherapy of Tuberculosis XIX.* L. M. DEWITT, B. SUYENAGA AND H. G. WELLS. J. Infect. Dis., Chicago, 1920, 27, 115-135.

A study of the effect of creosote and related compounds upon the tubercle bacillus showed that: "Virulent human tubercle bacilli are inhibited from growth (bacteriostatic action) on artificial mediums containing a concentration of 0.01 per cent each of resorcin, thymol, paracresol, orthocresol and metacresol. 0.05 per cent is the lowest concentration which completely inhibited in the case of creosol and pyrocatechin. Guaiacol, creosote, hydroquinone and guaiacol cacodylate required a concentration of 0.1 per cent to inhibit growth completely. Sodium guaiacolate inhibited completely at 1.7 per cent and partially at 0.8 per cent. Thiocol did not inhibit in 1 per cent concentration and styracol did not inhibit in 10 per cent suspension.

Bactericidal tests, with exposure of clumps of tubercle bacilli to solutions of these compounds, and also by the treatment of the bacilli in very thin layers on garnets, showed that creosote and its derivatives have a relatively low bactericidal power for the tubercle bacillus.

One hundred and six guinea pigs were treated with large doses of these compounds over a long period during various phases of infection with tuberculosis. No beneficial effect upon the course of the experimental disease was apparent.

It is concluded that creosote and guaiacol do not have a specific action on tuberculous infection.—S. B-J.

**2175. Ueber intrauterine Tuberkuloseinfektion.** (*Intrauterine Infection with B. tuberculosis.*) M. DUBOIS. Schweiz. med. Wchnschr., 1920, No. 35, 772-776.

An extended analysis of the literature on intrauterine infection with *B. tuberculosis* is followed by a case report. In the case in question both the mother and child came to autopsy and a miliary tuberculosis was found in both.—G. H. S.

**2176. Zur diätetischen Behandlung der Tuberkulose.** (*Dietetic Management in Tuberculosis.*) W. STROELTZNER. München. med. Wchnschr., 1920, 67, 981-982.

Dietetic management in tuberculosis has always had for its principal aim the production of an increase in weight regardless of other possible factors in the quality of the foods prescribed. Based upon the older researches of Thomas and of Weigert, it is concluded that an excess of carbohydrate in the diet is detrimental to the maintenance of a strong resistance to tuberculosis. Experiments on tuberculous children in which diets high and low in purines were fed gave no conclusive results. The author believes that a high purine diet has a favorable effect but his experimental results are not decisive on this point.—B. C.

**2177. Ueber die Pneumothoraxbehandlung der kindlichen Lungentuberkulose.** (*Pneumothorax in the Treatment of Juvenile Pulmonary Tuberculosis.*) HELENE ELIASBERG. Deutsche med. Wchnschr., 1920, 46, 961-964.

Production of prolonged artificial pneumothorax in juvenile pulmonary tuberculosis is considered an important forward step in treatment. That such treatment prolongs life by several years is now certain, but whether it will also lead to permanent cure is yet to be demonstrated.—B. C.

**2178. Zur Frage der offenen Lungentuberkulose im Säuglingsalter.** (*Open Pulmonary Tuberculosis in Nurlings.*) KLORS. München. med. Wchnschr., 1920, 67, 964.

In nurslings, pulmonary tuberculosis is to be considered open, i.e., in the contagious state, even in the absence of bacilli in the sputum. Such an assumption, if occasionally false, is however justified by the possible serious consequences due to the opposite point of view.—B. C.

**2179. Ueber die Einwirkung der Kriegsverhältnisse auf die Tuberkulosehäufigkeit unter den Münchener Kindern.** (*The Effect of War Conditions upon the Prevalence of Tuberculosis in Children of Munich.*) JOSEF BARTSCHMID. München. med. Wchnschr., 1920, 67, 957-959.

Children became tuberculous (as indicated by the Pirquet test) earlier in life during the war than during pre-war years. The tuberculosis death rate tendency, however, was not very markedly changed.—B. C.

**2180. Zur Kasuistik traumatischer Tuberkulosen. (A Case of Traumatic Tuberculosis.)** H. LAU. Deutsche med. Wchnschr., Berl. & Leipz., 1920, 46, 999.

A case is described in which minor injury to the testis produced a locus of reduced resistance followed three years later by tuberculosis of the organ.—B. C.

**2181. Eine metaluetisch-tuberkulöse Mischinfektion. (Metaluetic-Tuberculous Mixed Infection.)**

KARL ZEHNER. Schweiz. med. Wchnschr., 1920, No. 30, 651-653.

Report of a case.—G. H. S.

**2082. The Influence of Smallpox and Vaccination on Pulmonary Tuberculosis.** HORACE JOHN HAWK AND WILLIAM E. LAWSON. Am. Rev. Tuberc., Balt., 1920, 4, 490-501.

The report is that of an epidemic of smallpox occurring in a tuberculous sanatorium 6 years previously. Seven tuberculous patients contracted smallpox. The course of the smallpox attack was not noticeably different from that in well people and was apparently uninfluenced by the tuberculosis; likewise there was no apparent interruption in the recovery of the patients from tuberculosis during the course of the smallpox. Detailed records of the seven cases are given.—T. G. H.

**2183. Influenza as a Factor in the Activation of Latent Tuberculosis.** LOUIS C. BOISLINIERE. Am. Rev. Tuberc., Balt., 1920, 4, 534-540.

The author presents observations, opinions, and statistics showing that 15 to 20 per cent of new cases of active tuberculosis, arising since the onset of the 1918 epidemic of influenza, were caused by influenza, and that the incidence of active tuberculosis has increased to the same extent during that period and on that account.—T. G. H.

**2184. Welche Lunge erkrankt am häufigsten an Tuberkulose? (Which Lung Becomes More Frequently Tuberculous?)** A. E. MAYER. München. med. Wchnschr., 1920, 67, 935-936.

Examination of 2500 cases shows that the right lung is a little more frequently the site of infection from tuberculosis than the left.—B. C.

**2185. Tuberculosis Infection and Tuberculosis.** B. L. TALIAFERRO. South. M. J., Birmingham, 1920, 13, 574-575.

A brief paper discussing the difference between latent infection and active tuberculosis.—J. H. B.

**2186. Zur Lösung des Tuberkulinrätsels. (The Solution of the Tuberculin Riddle.)** HANS MÜCH. Deutsche med. Wchnschr., 1920, 46, 845-846.

Dilute acid splits up the tubercle bacillus into four distinct antigens: (1) water-soluble (partigen L); (2) protein, (partigen A); (3) fatty acid-lipoid, (partigen F); and (4) neutral fat-aliphatic alcohol (partigen N). Study of these has indicated the existence of the following laws. Each stimulant, or mixture of reactive substances, may be classified into certain biological groups, or partial antigen classes, and each partial antigen has a corresponding antibody. Total immunity is determinable only with the partial antigens, and not with a mixture of them. Absence of a reaction when whole antigen is tested does not necessarily indicate total absence of partial antibodies, for very often a test with the single partial antigens will give a marked positive reaction. There exists apparently a mutual inhibition of activity among the partigens when combined, and they become activated upon separation. Thus, absence of reaction with Old Tuberculin is not indicative of complete absence of antibodies. If it is separated by dialysis, one of its components will produce a decided reaction. The reactions of single partigens are different not only in kind, but in significance. In the case of the tubercle bacillus, a reaction with partigen L is unfavorable, while one with the others is of favorable prognosis. Reaction to pure tuberculin (such as partigen L is considered to be) appears to indicate a toxin hypersensitiveness which is injurious; while reaction to partigens A, F, N corresponds to immune-body hypersensitiveness which is a favorable condition.

The fundamental difference between the water-soluble and water-insoluble partial antigens is revealed in the fact that treatment with water-soluble partigens (pure tuberculin) results in a reduction of hypersensitiveness toward it, while treatment with the three water-insoluble partigens results in an increase.

Much believes that these facts provide the solution to the numerous puzzling and contradictory results obtained in the use of Old Tuberculin preparations in the diagnosis and treatment of tuberculosis.—B. C.

## DISEASES OF CHILDREN

(See also Numbers 2084, 2179, 2271)

**2187. Accuracy of the Schick Reaction.** ABRAHAM ZINGHER. J. Am. M. Ass., Chicago, 1920, 75, 1333.

The accuracy of the Schick test depends upon a standard toxin dilution of proper strength, accurate technic in injection and accurate interpretation of the reaction. The author found in certain cases the toxin offered by some commercial laboratories was not of proper potency

and caused negative reactions or incomplete reactions when control tests made with a toxin obtained from the research laboratory of the City of New York gave distinct reactions.—P. G. H.

**2188. Ueber Glossitis im Säuglingsalter. (Glossitis in Nurslings.)** B. WIENER. Berl. klin. Wehnschr., 1920, 57, 683-684.

A peculiar affection of the tongue was observed in 6 infants aged 2 to 12 months, all of whom were in poor nutritive condition. Sharply circumscribed spots with small whitish centers appeared on the tongue and oral mucosa. There were no signs of an inflammatory reaction in the neighboring areas or lymph glands. The disease disappeared spontaneously after an indeterminate period varying from several days to weeks. The etiology is obscure; it is not believed that the low nutritive state was the cause.—B. C.

## GYNECOLOGY AND OBSTETRICS

(See also Number 2295)

**2189. Ueber die Behandlung des fiebernden Abortes. (The Treatment of Febrile Abortion.)** B. ZELNIK. Wien. klin. Wehnschr., 1920, 33, 580-582.

In the treatment of septic abortion it is a question whether to wait until the febrile reaction has passed or to remove at once the infected intrauterine areas. A comparison of both methods of treatment indicate that they are equal in value as regards subsequent complications or mortality.—B. C.

**2190. Eine Infektionsquelle für stillende Frauen und die Prophylaxe der Mastitis. (A Source of Infection for Nursing Women and the Prophylaxis of Mastitis.)** LEOPOLD FEILCHENFELD. Berl. klin. Wehnschr., 1920, 57, 686-687.

Prophylactic treatment for ophthalmia neonatorum with silver nitrate results in a mild conjunctivitis in the infant lasting sometimes for several weeks. This conjunctivitis soon becomes purulent in character. During the nursing period the infant, by pressing its eyes against the breast of the mother massages the eye secretions loaded with pyogenic bacteria into the breasts and nipples. This source of infection is a very real one and should be guarded against, especially by bandaging the infant's eyes during nursing.—B. C.

**2191. Terpentinölinjektionen bei der Behandlung entzündlicher Adnextumoren. (Turpentine Oil Injections in the Treatment of Inflammatory Swellings of Uterine Adnexa.)** JULIUS SONNENFELD. Berl. klin. Wehnschr., 1920, 57, 707-708.

In a total of 115 cases of inflammatory tumors (gonorrheal and non-gonorrheal) of the female genitalia the author found that intramuscular injections of 0.5 cc. of a 20 per cent solution of turpentine oil in olive oil resulted in a rapid subsidence of the inflammation and early cure.—B. C.

**2192. Ueber die Behandlung der puerperalen Sepsis mit Fulmargin. (The Treatment of Puerperal Sepsis with Fulmargin.)** FRITZ ARON. Deutsche med. Wehnschr., Berl. & Leipz., 1920, 46, 968-969.

Collargol, a valuable antiseptic, has the disadvantage that it frequently causes a foreign protein reaction after intravenous injection. Fulmargin is a colloidal silver preparation produced by the electrical dispersion of the metal, and contains no protective protein colloid. This substance is efficacious in combating puerperal sepsis.—B. C.

## DERMATOLOGY

(See also Numbers 1966, 2182, 2299, 2308, 2313, 2318)

**2193. Protein Sensitization in Eczema of Adults.** HOWARD FOX AND J. EDGAR FISHER. J. Am. M. Ass., Chicago, 1920, 75, 907.

Most reports on eczema published deal with eczema of infants or children. It is difficult to reach definite conclusions in regard to the value of protein skin tests in eczema of adults. In the authors' work skin tests were made with a number of commercial proteins. The results have varied considerably, but ultimately they will probably be of therapeutic assistance in a small proportion of cases of eczema in adults.—P. G. H.

**2194. Infectious Eczematoid Dermatitis.** RICHARD L. SUTTON. J. Am. M. Ass., Chicago, 1920, 75, 976.

From the cases observed the author concludes: "No one realizes better than I that our present knowledge of anaphylaxis, and particularly as related to the etiology of cutaneous disorders, is far from complete. Nevertheless, I believe we may safely assert that this phenomenon plays an important part in the prolongation, if not in the actual causation, of many cases of infectious eczematoid dermatitis."—P. G. H.

**2195. *An Epidemiological Study of an Endemic Focus of Leprosy.*** MARK F. BOYD AND WARREN F. FOX. Pub. Health Rep., Wash., 1920, **35**, 3007-3018.

The endemic area is a moderate sized subtropical city on an island in the Gulf of Mexico, 2 or more miles distant from the mainland. In a period of 30 years, 45 cases have occurred. The maximum number of onsets among those born elsewhere occurred during the second decade of residence, and among those born locally during the second decade of life. The data collected indicate that contact or association with cases of leprosy is concerned in the development of the disease.—I. A. B.

**2196. *Treatment of Leprosy with the Dean Derivatives of Chaulmoogra Oil. Apparent Cure in Seventy-eight Cases.*** J. T. McDONALD. J. Am. M. Ass., Chicago, 1920, **75**, 1483.

In many nerve cases detection of the leprosy bacillus is impracticable. Since October 1, 1918, 78 patients have been paroled as no longer a menace to public health. Treatment with chaulmoogra oil comes near to being a specific for leprosy. The oil is injected by means of a 20 cc. all-glass Paris syringe. The site chosen is the upper and outer quadrant of the gluteal region, the area for the puncture being painted with tincture of iodine. Abscess formation has been observed in only one case out of 6924 deep injections.—P. G. H.

**2197. *Lupus Erythematosus and Focal Infection.*** M. B. HARTZELL. Arch. Dermat. & Syph., Chicago, 1920, **2**, 444-446.

A case is reported in which marked improvement followed the extraction of a tooth with diseased root. The possible relation to streptococcus focal infections is discussed.—R. D. H.

**2198. *The Cultivation of Epidermophyton inguinale.*** D. L. FARLEY. Arch. Dermat. & Syph., Chicago, 1920, **2**, 466-469.

Important points in technic for the successful cultivation of the organism are emphasized. Gentian violet blood maltose agar is the medium of choice. After careful cleansing of the skin surface a large amount of the scrapings are obtained and transferred within a comparatively short time to previously prepared plates. A description is given of a method of sealing plates to prevent drying.—R. D. H.

**2199. *Streptodermatitis, Especially in its relation to Wounds.*** D. W. MONTGOMERY AND G. D. CULVER. Arch. Dermat. & Syph., Chicago, **2**, 649-653.

The author classifies streptodermatitis as an infective disease caused by an anaerobic streptococcus. A clinical description of the condition and special considerations of treatment are given.—R. D. H.

**2200. *Cutaneous Reactions to Focal Infection, with Clinical and Pathological Report of Two Cases.*** I. L. MCGLOSSON. Texas State J. M., 1920, **16**, 165-166.

A report of two cases of skin eruptions following infection in one, of the tonsils and in the other, the antrum. Attention to the foci of infection resulted in prompt disappearance of the skin lesions.—J. H. B.

**2201. *Lichtbehandlung bei Geschlechtskrankheiten (kombinierte Hg- und Lichtbehandlung) nach 20 jähriger Erfahrung. (Heliotherapy in Sex Diseases (Combined Mercury and Heliotherapy) after 20 Years' Experience.)*** BRIEGER. München. med. Wchnschr., 1920, **67**, 1012-1015.

Though light is by no means a grand cure-all in venereal diseases, especially syphilis, it is nevertheless capable when correctly combined with specific treatment to so increase and strengthen immune bodies that the organism can conquer the remaining spirochetes and their poisons. It appears therefore, that in this field, "high-altitude" sun treatment has a certain amount of value as is the case in tuberculosis.—B. C.

**2202. *Ein Fall von Dermatomyositis, Überraschende Heilung bei Salvarsanbehandlung. (A Case of Dermatomyositis Remarkably Cured by Salvarsan.)*** KROEMER. München. med. Wchnschr., 1920, **67**, 1015-1016.

As a complication to an acute arthritis there occurred a form of focal skin and muscle infiltration described as dermatomyositis. This appeared over the whole body with the exception of the face, hands and feet. The lesions were rather small, deep, painful intracutaneous areas without much surface reddening, and were unaffected by local treatment. The internal organs and the nervous system remained free of demonstrable pathological change. The blood was somewhat anemic and showed a slight increase in polynuclears.—B. C.

**2203. *Zur Verwendung von Kalium hypermanganicum bei Behandlung von Furunkeln und Karbunkeln. (The Use of Potassium Permanganate in the Treatment of Furuncles and Carbuncles.)*** FRIES. Deutsche med. Wchnschr., Berl. & Leipz., 1920, **46**, 914.

Potassium permanganate in 10 per cent solution has been found very effective in combating furuncles and carbuncles.—B. C.

## OPHTHALMOLOGY

**2204. Focal Infection as a Factor in the Production of Secondary Inflammations Following Operations and Injuries of the Eye.** R. H. T. MANN. *Texas State J. M.*, 1920, 16, 159.

A brief preliminary paper in which the author calls attention to his finding of foci of infection in a large per cent of cases of iridocyclitis following injuries or operation. He advises search for and removal of all such foci before operations are done or in the treatment of injuries to the eye.—J. H. B.

**2205. Tuberculin.** J. F. SPRING. *M. J. Australia*, Sydney, 1920, Vol. 1, No. 6, 121-123.

A discussion of tuberculin (T. R.) from the standpoint of the ophthalmologist.—C. P. B.

**2206. Experimentelles und Klinisches über die Optochinwirkung.** (*Experimental and Clinical Observations on the Effect of Optochin.*) RUDOLF SCHNEIDER. *München. med. Wehnschr.*, 1920, 67, 1006-1008.

Optochin is a selective disinfecting agent against pneumococci. It shows a specially retardative effect upon the growth and development of these organisms. Its bactericidal power is in comparison markedly lower and not nearly as great as has been generally assumed. This is due to the precipitating effect of serum and protein compounds upon the optochin. Subconjunctival injections of optochin in 0.5 to 1.0 per cent solution result in tissue damage. In pneumococcus conjunctivitis, treatment with optochin has no advantage over that with silver nitrate.—B. C.

## OTOLOGY AND NOSE AND THROAT DISEASES

(See also Number 2200)

**2207. The Pathological Histology of Tonsils Containing Hemolytic Streptococci.** ELLIS KEL-  
LERT. *J. Med. Research*, Bost., 1920, 41, 387-398.

Seventy pairs of tonsils obtained chiefly from infantrymen at Camp Stuart, Va., were examined. The men were on active duty and presented no evidence of systemic disease.

Bacteria in variable numbers were always present in the crypts. Masses of cocci and bacilli were to be seen lying free in the crypt or in contact with the epithelium. Hemolytic streptococci were often present in the crypts, apparently existing as saprophytes. The bacterial masses were in some cases found to be large friable granules. Such granules may mechanically cause ulceration of the epithelium of the crypts, with subsequent systemic infection.

The pathological changes in the tonsils are described, and illustrated by six photomicrographs. Inflammatory changes distinctive of infection with hemolytic streptococci could not be found.—A. C. E.

**2208. Vincent's Disease.** JOHN J. SHEA. *South. M. J.*, Birmingham, 1920, 13, 524-528.

A general descriptive article in which the author claims that medicinal treatment gives only temporary relief and surgical treatment is indicated for permanent relief. He believes that the disease should be reportable.—J. H. B.

## ORAL BACTERIOLOGY

(See also Numbers 2054, 2197, 2204, 2209)

**2209. A Study of Streptococci Obtained from the Mouth in Cases of Chorea.** CLEVELAND FLOYD. *J. Med. Research*, Bost., 1920, 41, 467-479.

Streptococci obtained from about the teeth and from the crypts of the tonsils in 20 cases of acute chorea were studied. Pure cultures of streptococci were obtained readily in most instances, both from the teeth and the tonsils. In 3 of the cases one or more cultures failed to show streptococci.

Cultures from the teeth and tonsils of 10 children whose throats appeared normal developed streptococci in only 3 cases.

With the exception of 2 strains of hemolytic streptococci the organisms fell into 2 groups; one of which produced a greenish zone of hemolysis, the other had no action on blood agar. Twenty-four rabbits were experimentally inoculated. In 4 of them definite vegetative endocarditis was produced. In 8 there was acute swelling of the joints.—A. C. E.

**2210. Beiträge zur Aetiologie der Zungenaktinomykose.** (*The Etiology of Actinomycosis of the Tongue.*) C. HARMS. *München. med. Wehnschr.*, 1920, 67, 903-904.

The source of actinomycotic infection is usually material of vegetable origin to which the organism or its spores have become attached. Granules and hairs of grain are the most prolific agents for initiating the infection because of their mechanical properties. They break the continuity of the oral mucosa and become attached to it, thus permitting adherent spores to develop and produce the actinomycotic granuloma.—B. C.

**2211. Chronic Disease and its Association with Focal Sepsis.** S. PERN. M. J. Australia, Sydney, 1920, Vol. 1, No. 11, 229-232.

These cases studied were classified as arthritic, cardiac, pulmonary, gastric and goitre or thyrotoxic. Dental lesions predominatè in persons over 30, while tonsillar infections predominate in those under 30 years of age. Of 989 cases studied, 58 per cent showed some form of focal infection.—C. P. B.

#### FILTERABLE VIRUSES

(See also Numbers 2081, 2240, 2217)

**2212. Die Resultate des ätiologischen Fleckfieberforschung.** (The Etiology of Typhus Fever.) R. DOERR. Schweiz. med. Wchnschr., 1920, No. 30, 637-644.

The literature on the etiology and serology of the disease is reviewed and discussed. No essentially new data are added.—G. H. S.

#### SURGICAL BACTERIOLOGY

(See also Numbers 2146, 2287, 2288)

**2213. Bacillus perfringens: Toxin and Antitoxin Production.** A. H. W. CAULFIELD. J. Infect. Dis., Chicago, 1920, 27, 151-164.

This paper records observations made in the production of an antiserum to *B. perfringens* and *B. tetani*. The most favorable medium for the production of toxin and maintenance of virulence in cultures of *B. perfringens* was 0.2 per cent glucose broth with sterile fresh muscle (not autoclaved). The technic of preparing muscle broth is given in detail. In this medium, virulence of the organism was more readily maintained than by direct passages from animal to animal (pigeons and guinea pigs). A toxin, of which 0.02 cc. produced death of a pigeon weighing 300 grams in 10 to 12 hours was used to immunize horses.

The serum of horses treated with 950 to 1800 cc. of toxin broth in small doses over periods of about 6 months, neutralized *perfringens* toxin and protected animals against infection with virulent cultures. The potency of the antiserum was such that 0.06 to 0.001 cc. neutralized 1 minimum lethal dose of the toxin.

It was found that it was possible to immunize horses or the same horse simultaneously against the toxins of *B. tetani* and *B. perfringens*, and the author suggests preparing in this way polyvalent serums against the products of the several pathogenic anaerobes which were found to be important in the infections of war wounds.—S. B-J.

**2214. Serologic Groupings of *Vibrio septique* and Their Relation to the Production of Toxin.**

MURIEL ROBERTSON. J. Path. & Bacteriol., 1920, 23, 153-170.

Twenty-three strains of *Vibrio septique* were collected and "typed" by agglutination and absorption tests. It was found to be possible to produce an agglutinating serum in the rabbit by injections intravenously of cultures washed and heated to 56°C. This serum often had a titre of 1:25,000. Macroscopic agglutinations were made of fresh cultures with this serum, the tubes being incubated 2 to 3 hours at 56°C. At least three distinct serologic races were found in this way. There was slight cross-agglutination, especially between the first two groups. Impure cultures were found to be inagglutinable. Of 11 strains tested for toxin production all gave a soluble toxin. 0.1 to 1.0 cc. injected intravenously into rabbits caused death with convulsions in 3 to 10 minutes. It was found that a monotypical antitoxin neutralized the toxins of all three groups, seeming to show that while the groups differed in the production of agglutinins the toxins and antitoxins are serologically identical.—L. C. H.

**2215. The Precipitation of *B. welchii* Toxin.** HERBERT HENRY AND MARGARET LACEY.

J. Path. & Bacteriol., 1920, 23, 273-285.

The toxin of *B. welchii* differs from diphtheria and tetanus toxins in two particulars: (1) it is produced rapidly, the maximum being 12 to 24 hours followed by a decrease in toxicity; (2) it is of low potency, containing at best only 5 to 10 lethal doses for a mouse per cubic centimeter. The authors sought to decrease the bulk and increase the potency of the toxin by precipitation. By double precipitation, first with ammonium sulphate and then with alcohol, they obtained solutions containing from 50 to 250 lethal doses for mice per cubic centimeter. Specimens of this preparation stored at room temperature in amber bottles for 11 months showed no deterioration.—L. C. H.

**2216. Antisepsis mit gasförmigen Antiseptics.** (Gaseous Antiseptics.) FR. STEINMANN.

Schweiz. med. Wchnschr., 1920, No. 25, 509-512.

The use of streaming oxygen, introduced into a wound or infected cavity by means of a rubber catheter is described. Such treatment is effective in eliminating both aerobic and anaerobic organisms. Streaming air, in the place of oxygen, can be employed with good results. In some cases the gas can with advantage be passed through such solutions as tincture of iodine, formalin, chloroform, eucalyptol, ether, menthol, etc., before it is introduced into the infected area.—G. H. S.

**2217. Zur Angina Ludowici. (Ludwig's Angina.)** GUSTAV NEUGEBAUER. Deutsche med. Wehnschr., Berl. & Leipz., 1920, 46, 942-943.

The etiology of this rather rare disease affecting the submaxillary and sublingual glands is still obscure. Its general course would indicate that it is an infection due to a specific virus as is the case with epidemic parotitis.—B. C.

**2218. Actinomycosis Treated with Methylene Blue and Roentgen Ray.** VIGGO W. JENSEN AND C. W. SCHERY. J. Am. M. Ass., Chicago, 1920, 75, 1470.

A case is reported by the authors which was cured by the use of methylene blue and roentgen ray. It is suggested that roentgen ray or radium by itself is probably a curative agent.—P. G. H.

**2219. Ueber das Resorptionsvermögen des Granulationsgewebe. Zugleich ein Beitrag zur Lehre von den "ruhenden Infektion." (The Resorptive Ability of Granulation Tissue. A Contribution to the Study of the "Resting Infection.")** EDUARD MELCHIOR AND FELIX ROSENTHAL. Berl. klin. Wehnschr., 1920, 57, 293-296.

The mechanical factors involved in the formation of scar tissue and the resulting structures sometimes provide the conditions for so-called resting or latent infections. Infective organisms become walled off for a time by granulation tissue which through traumatic insult loses its integrity and permits the latent infection to become an active one.—B. C.

**2220. Ueber Periostitis rheumatica acuta. (Acute Rheumatic Periostitis.)** ROB. LEHMANN. Deutsche med. Wehnschr., Berl. & Leipz., 1920, 46, 970.

A case is reported in which an acute rheumatic periostitis localized at the site of an old operation—apparently a point of low resistance.—B. C.

**2221. Vorschläge zur Befreiung des Venenkreislaufes und zur direkten Desinfektion des Gehirns. (Suggestions for Relieving the Venous Circulation and the Direct Disinfection of the Brain.)** ANTON AND VOELCKER. München. med. Wehnschr., 1920, 67, 951-953.

From anatomical investigations, it has been found possible to relieve strain of the venous circulation by puncture into the confluens sinuum to the longitudinal sinus or the sinus rectus respectively. This mode of entry into the circulation of the central nervous system makes possible the direct disinfection of either of the hemispheres, or the brain-stem or both.—B. C.

**2222. Hyperämie zur Behandlung chirurgischer Krankheiten. (Hyperemia in the Treatment of Surgical Cases.)** ALBERT SACHS. Berl. klin. Wehnschr., 1920, 57, 322-324.

All wounds, whether infected or not, are capable of being protected against any deep staphylococcus or streptococcus infection by suitable and timely warm baths that tend to produce a hyperemia. Wound infections due to these organisms are definitely curable by such baths. A general septicemia or need for amputation should never occur as a result of a phlegmon. Protracted warm baths produce a hyperemia, elimination of wastes and ultimate cure.

On pages 331-333 of this Journal is the report of a commission of the Breslau Surgical Society appointed to examine into the claims of Sachs. It was found that the Sachs technic was suitable for minor surgical wounds, etc., but was inadequate to cope with extensive or severe infections.—B. C.

**2223. Zur ruhenden Infektion (rezidivierende Osteomyelitis, entzündlicher Tumor.) (Latent Infection,—Recurring Osteomyelitis, Suppurative Tumor.)** MOST. Berl. klin. Wehnschr., 1920, 57, 376.

Two cases are cited in which infections were latent for 16 and 18 years respectively, and erupted again after trauma. In the healed scar tissues of those wounded in war, there have frequently been found viable and virulent organisms.—B. C.

**2224. Ueber künstliche Erzeugung verschiedenartiger Granulationsneubildungen und Zellwucherungen. (The Artificial Production of Various Scar Tissue Growths and Cell Responses.)** S. BERGEL. Berl. klin. Wehnschr., 1920, 57, 341-344.

In normally occurring defense processes of the body against a pathogenic irritation there arise specific cellular or tissue responses. These comprise not only new serum constituents (antibodies) but also morphological variations of certain cell groups which are to be considered the result and expression of the change and establishment of their manufactured reaction-products corresponding to the chemical nature of the pathogenic invader. The conclusions are drawn from experiments in which lecithin, pure, and in aqueous or oily solution was injected into tissues and the cellular response observed.—B. C.

## SEROLOGY

(See also Numbers 1949, 1954, 2104, 2214)

**2225. Further Observations on the Effect of Roentgenization and Splenectomy on Antibody Production.** L. HEKTOEN. J. Infect. Dis., Chicago, 1920, 27, 23-30.

The removal of the spleen of rabbits just before the injection of sheep's blood diminished the production of precipitin and hemolysin. The effect of this operation was variable, except



when the spleen was removed 8 or 9 days after the injection of the antigen. Several experiments showed clearly that after antibody production is well under way, splenectomy has little or no effect on the course of the antibodies in the blood.

As time passes after roentgenization, the power of a rabbit to produce antibodies may be increased. It is suggested that this increase may be due to regenerative changes in the spleen and lymph nodes.—S. B-J.

**2226. Development of the Bactericidal Power of Whole Blood and Antibodies in Serum.** J. H. BLACK, KENNETH FOWLER AND PAUL PIERCE. J. Am. M. Ass., Chicago, 1920, 75, 913.

The bactericidal power of blood is the most dependable criterion of immunity in animals. The bactericidal power of blood against typhoid and Shiga bacilli was identical with that of the serum, without regard to the method of inoculation. Agglutinins and complement fixation antibodies were only roughly comparable with the bactericidal power. Phagocytic index and leucocyte counts were of no value in estimating the degree of immunity. When rabbits were immunized with typhoid and dysentery bacilli lysis occurred rapidly and a short incubation period was found to be sufficient. The mechanism of lysis could not be determined, but phagocytosis probably was not a factor. The bactericidal power of citrated and defibrinated blood was not decreased, but the reaction was slower. In the blood of animals immunized with typhoid and dysentery bacilli foreign organisms may grow well. The refractory stage of Teague and McWilliams depends probably on a rapid rise of bactericidal power. Inactivation of immune serum did not materially reduce bactericidal power.—P. G. H.

**2227. Some Experiments Bearing on the Local Formation of Antibodies.** W. W. C. TOPLEY. Proc. Roy. Soc. Med., Lond., July, 1920, Section of Pathology, 144-149.

Suspension of killed cultures of *Staphylococcus aureus* amounting to one billion organisms were injected into the thigh muscles of rabbits. The animals were anaesthetized and bled to death. Perfusion with one liter of salt solution was accomplished through the descending aorta. The tissue was removed from the point of inoculation and from some distant point, finely ground with sterile sand and centrifuged until a clear extract was obtained.

These extracts had no effect upon phagocytosis either alone or in conjunction with the serum of the rabbits. The author concludes that there is no evidence that antibodies are produced by the tissues at the site of inoculation.—G. H. R.

**2228. Opsonic Reactivation of Antipneumococcus Serum.** J. MEYER. J. Infect. Dis., Chicago, 1920, 27, 82-85.

The opsonic activity of antipneumococcus serums was tested using pneumococci and human leucocytes. The serum, salt solution, leucocytes and bacterial suspensions were mixed in capillary pipettes, incubated for 30 minutes at 37°C., smears made and stained with carbol thionin. The degree of phagocytosis was estimated by counting the number of leucocytes per 100 that showed phagocytosis and also the number of pneumococci ingested by each leucocyte. In the activation experiments, 0.01 cc. of fresh serum was added to the mixtures.

Stock antipneumococcus serums (from the Army Medical School) which agglutinated Types I, II and III pneumococci were found to have only slight opsonic action on homologous pneumococci, being less active in this respect than fresh normal human serum. The opsonic power of these serums was increased by the addition of a small quantity of fresh normal human serum. Serums from patients after their recovery from pneumonia were opsonic for the infecting types of pneumococci. This power, however, was greatly reduced when the serum was heated to 56°C. for 30 minutes, but was restored by the addition of fresh normal human serum, which was of itself only feebly opsonic. The conclusion reached is that the opsonin in antipneumococcus serum can be reactivated.—S. B-J.

**2229. The Antigenic Properties of Hemocyanin.** CARL L. A. SCHMIDT. J. Immunol., Balt. & Cambridge, Eng., 1920, 5, 259-264.

A preparation of hemocyanin from the fluid of the abalone (*halotis*) proved antigenic in rabbits as the serum gave positive fixation and precipitin tests. It was toxic for guinea pigs previously sensitized to this substance but not toxic for normal animals. Hemocyanin appears to be a globulin and the experiments support the chemical viewpoint that the chemical make-up of hemocyanin is very different from hemoglobin since the latter is non-antigenic. The antigen was prepared according to the following method. The opaque fluid was saturated with oxygen, filtered and an equal volume of saturated ammonium sulphate solution was slowly added, the fluid being constantly shaken to prevent local zones of high ammonium sulphate concentration. The blue precipitate was filtered off on hardened filter paper, then dissolved in large volume of distilled water, and saturated ammonium sulphate solution again added to make a concentration of 4 cc. to each 10 cc. of solution. The precipitate was again filtered off, dissolved as before and reprecipitated by addition of ammonium sulphate to a concentration of 4.3 cc. per 10 cc. of fluid. The precipitate was filtered, redissolved centrifuged to remove a trace of insolvent matter and dialyzed first against running and then distilled water, toluol being used as a preservative. The salt-free solution contained a small amount of white precipitate, probably hemocyanin from which the copper had been split. This was removed by centrifuging. The hemocyanin solution was concentrated by blowing warm dry air over the surface, made isotonic by addition of sodium chloride and for injection preserved with 0.25 per cent phenol. Normal rabbits received 8 injections in doses of 80 mgm.—R. R. H.

**2230. On The Transfer of the So-Called Normal Antibodies from Mother to Offspring. I. Agglutinins.** G. C. REYMANN. *J. Immunol., Balt. & Cambridge, Eng.*, 1920, 5, 227-238.

The transmission of natural agglutinins in the blood of goats from mother to offspring was studied. All the kids except one in a total of 14 were born without agglutinin for coli, typhoid, horse and rabbit red cells. The agglutinin appears soon after birth, the maximum in the blood of the kid may occur as early as about 11 hours after birth. The kids probably derive it from the mother through the milk which is found accumulated at parturition. It disappears from the milk as well as from the kid's serum in the course of a few days but appears again after a few months probably in consequence of immunization from the flora of the digestive tract. Injections of horse corpuscles into kids increases the agglutinating power against these corpuscles as well as against colon bacilli. By injecting colon bacilli the agglutinating power increases also against horse corpuscles.—R. R. H.

**2231. Observations on a Sex Difference in the Presence of Natural Hemolysin in the Rat.** YOSHIO SUZUKI. *Am. J. Physiol., Bost.*, 1920, 53, 483-487.

The author found that natural hemolysin for the red blood corpuscles of pigs is not usually present in the serum of albino rats under 30 to 50 days of age. In older animals this hemolysin may be present in the serum of both sexes but is more frequent in blood of the female than of the male. He found further that during pregnancy and for the week following parturition anti-pig hemolysin is not only more active but the proportion of occurrences is far greater than among normal non-breeding females. It was also noted that the number of individuals in which the anti-pig hemolysin is present in males tends to increase with the appearance of infections of the lungs.—R. E. B.

**2232. On the Protection Afforded to Red Cells against Hemolysis by Eosin.** C. L. A. SCHMIDT AND G. F. NORMAN. *J. Infect. Dis., Chicago*, 1920, 27, 40-45.

Experiments showed that egg white, blood serum, casein, edestin and peptone inhibit the lytic action of eosin on red cells. Gelatin lacked this protective power. In these tests, 1 cc. of 1:10,000 solution of Grubler's w.g. eosin in salt solution was mixed with 0.5 cc. of 5 per cent sheep or ox erythrocytes, and to this mixture were added the substances to be tested for protective action. The reaction was adjusted to pH 7.8-8. The tubes were placed in the sunlight for 30 minutes and after this exposure placed in the ice box. The amount of hemolysis was read after 3 and 18 hours. Tubes kept in the dark as controls ruled out any other hemolytic factor than the photodynamic action of the fluorescent dye.

The absence of certain aromatic amino acids, tyrosin and tryptophane, from gelatin was apparently related to the inability of gelatin to protect red cells against lysis by eosin. To prove this, the action of the amino acids was studied. It was found that tyrosin and tryptophane in saturated (1:2400) and  $\frac{M}{2}$  solutions completely inhibited the photodynamic action of eosin, giving marked protection against hemolysis. On the other hand, phenylalanin, glycocoll, leucin, aspartic acid, alanin, cystin and glutamic acid were ineffectual. From these data it was concluded that the hydroxyphenol group in a molecule is one of the important factors determining its ability to protect against fluorescent substances.—S. B-J.

**2233. Potency of Some Old Human Isohemagglutinating Serums.** M. W. LYON. *J. Am. M. Ass., Chicago*, 1920, 75, 1002.

Samples of parasthenic, II, and antiparasthenic, III, isohemagglutinating serum have been kept preserved with 0.5 per cent phenol in the ice box for one year. Agglutinating activities were preserved and they did not give nonspecific agglutinations. When kept in a desiccated pulverized state in an ice box and redissolved in 0.5 per cent solution of phenol in distilled water good agglutinating properties remained. The dry serums were inferior to the phenol-preserved serums. A tendency to nonspecific agglutination was also observed in the dry serums.—P. G. H.

**2234. Natural Antihuman Hemolysins and Hemagglutinins in Horse Sera in Relation to Serum Therapy.** J. A. KOLMER AND MOTOMATSU MATSUMOTO. *J. Immunol., Balt. & Cambridge, Eng.*, 1920, 5, 75-88.

Macroscopic and microscopic tests of 30 commercial immune horse serums (antistreptococcus, antipneumococcus, anti-influenzal, antimeningococcus, antitetanus and 2 normal) for their agglutinating and hemolytic effects on human red cells showed the presence of a small amount of hemagglutinin in practically all cases in dilutions of 1:2. With a dilution of 1:11 about 50 per cent of the horse serums contained hemagglutinins for the red cells of certain persons. None gave a reaction with a dilution higher than 1:64. No single serum contained agglutinins for the red cells of all persons tested, indicating to the writer the presence of group hemagglutinins for the different groups of human erythrocytes. Fresh horse sera may contain natural anti-human hemolysins, but these are only occasionally found in older and preserved serums. The hemagglutinins of horse serum deteriorate rapidly. Desiccation tends to destroy the natural hemagglutinins. Horse serums contain larger amounts of agglutinins and hemolysins for rabbit than for human erythrocytes. Intravenous injections of rabbits with large amounts of horse serum produced no ill effects, making it highly probable that the intravenous injection of preserved horse serum does not introduce sufficient agglutinin and hemolysin for human red cells to produce ill effects referable to intravascular agglutination and hemolysis, especially if the serum is diluted and injected slowly.—R. R. H.

**2235.** *An Attempt to Produce Specific Immune Agglutinins and Hemolysins for the Four Groups of Human Erythrocytes.* JOHN A. KOLMER AND MARY E. TRIST. *J. Immunol., Balt. & Cambridge, Eng.*, 1920, **5**, 89-96.

The serums of rabbits immunized to human corpuscles belonging to the 4 different groups did not contain specific agglutinins and hemolysins for the corpuscles of the group used as antigen. Absorption to remove the group agglutinins and hemolysins generally resulted in the removal of all agglutinins and hemolysins.—R. R. H.

**2236.** *Some Observations on the Constitution of the Complements of Different Animals.* T. J. MACKIE. *J. Immunol., Balt. & Cambridge, Eng.*, 1920, **5**, 379-389.

There is strong evidence that albumin, pseudoglobulin and euglobulin separated by ammonium sulphate represent different complement constituents and the two moieties of the pseudoglobulin certainly show a striking difference when separated by carbon dioxide after Liefman's method. A number of experiments were carried out with a view to throwing light on the structure of complement and especially the venomactivating constituent of serum. The technic used was described originally in the *Journal of Pathology and Bacteriology*. The results show a marked difference in the constitution of the complement of different animals apart from their relative activity with hemolytic immune body and venom. In the case of human and rabbit serum acting on ox erythrocytes plus immune body or venom, the complement is associated entirely with the globulins of the serum while with guinea pig serum the albumin fraction is also an essential constituent of the complement. With human and rabbit serums, acting with venom, the effect of the globulin is "masked" in the whole serum by the albumin while with guinea pig serum the albumin also contributes to the full action of the serum along with the globulin. In the case of horse serum the activating effect with venom is due not only to a complement body represented by the globulin but also to the lecithin contained in the albumin fraction.—R. R. H.

**2237.** *Precise Titration of Complement.* S. C. BROOKS. *J. Med. Research, Bost.*, 1920, **41**, 339-409.

A critical study of the conditions causing error in complement titration and the adoption of appropriate modifications of the customary methods has enabled the writer to titrate complement with a probable error of about 1 per cent in the relative efficiency of one or more samples.

The most important modifications are: (1) Substitution of a physiologically balanced solution especially adapted to the red blood cells employed, in place of the "normal salt solution" usually used as a diluent; (2) determinations of the proportion of cells hemolyzed in each mixture rather than of the number of cells; i.e., the depth of the color of the supernatant fluid; (3) interpretation of the results of titration by determining the relative amounts of complement necessary to cause given degrees of hemolysis in a definite length of time. This is done by graphic interpolation in the most accurately known portion of the titration curves, chosen degrees of partial hemolysis being substituted for complete hemolysis in determining the end-point.—A. C. E.

**2238.** *The Regeneration of Complement after Radiation or Heating.* S. C. BROOKS. *J. Med. Research, Bost.*, 1920, **41**, 411-424.

After partial photoinactivation, complement deteriorates slowly at 7°C. and more rapidly at 37°C. The rate of deterioration is the same as that of normal complement. After partial thermoinactivation, complement recovers a portion of its lost hemolytic power. It is suggested that the regeneration may be attributable to the presence of a parent substance which is less sensitive to high temperatures than the hemolytic principle, but equally sensitive to radiation.—A. C. E.

**2239.** *A Record of an Inagglutinable Form of Shiga's Dysentery Bacillus, Experimentally Derived from an Agglutinable Culture.* T. H. C. BENIANS. *J. Path. & Bacteriol.*, 1920, **23**, 171-176.

An emulsion of Shiga's bacillus in tragacanth was injected subcutaneously into a guinea pig, forming a chronic abscess. No agglutinins were produced in the guinea pig's serum as a result of the injection. Two months after the injection the abscess was cultured. No phagocytosis was evidenced. The culture gave two different colonies, one kind having the typical appearance of dysentery cultures, the other kind of colony being smaller, granular and more opaque. The cultures from the typical colonies were agglutinated by serum, the others were not. With successive subcultures this inagglutinable strain threw off typical agglutinable colonies, particularly in the earlier subcultures. Rabbits immunized against either strain were protected against the other strain. In the rabbit injected with the inagglutinable strain immunity developed against both strains without the production of agglutinins.—L. C. H.

**2240.** *Serologische Untersuchung von Kaninchen nach Behandlung mit Fleckfieber Virus. (Serological Study of Rabbits after Treatment with Typhus Virus.)* E. WEIL AND A. FELIX. *Wien. klin. Wchnschr.*, 1920, **33**, 423-424.

Brain of typhus infected guinea pigs does not give rise to agglutinins for  $X_1$  in normal guinea pigs, but always produces agglutinins for  $X_1$  in rabbits. Normal guinea pig brain

has no effect on the  $X_{11}$  antibody production in rabbits.  $X_{11}$  agglutinating rabbit sera show only the usual normal agglutination with  $X_{11}$ , *B. typhi*, Shiga and Flexner dysentery bacilli, *Proteus vulgaris*, *B. coli* and *M. melitensis*.  $X_{11}$  agglutinins are fixed in positive rabbit sera only by  $X_{11}$ . The normal brain fixes only the resulting heterogeneous sheep's blood hemolysin, while on the other hand, it leaves  $X_{11}$  agglutinins untouched. These facts indicate that the agglutinin of typhus fever virus is identical with the specific main receptor (O-receptor) of  $X_{11}$ , and that typhus fever agglutination in man, produced by the virus, is a specific immunological reaction.—B. C.

**2241. A Comparative Study of Methods for the Preparation of Typhoid Agglutinogens.** J. F. SANDS. *J. Immunol.*, Balt. & Cambridge, Eng., 1920, 5, 97-109.

Twenty-one agglutinogens of a single strain of *B. typhosus* were prepared after various methods and tested against the sera of rabbits immunized with the same culture to determine the influence of the technic of preparation upon the susceptibility to specific agglutination by the immune serums. The writer concludes that the best agglutinin of the typhoid bacillus is prepared by cultivating the organisms on solid media for 48 hours, removing the growth with 0.85 to 1 per cent chemically pure sodium chloride in distilled water, heating at 60°C. for 2 hours, shaking with beads until a perfectly homogenous emulsion is secured, diluting with saline solution to proper density (about 2.10<sup>9</sup> per cubic centimeter), and adding formalin to 1 per cent.—R. R. H.

**2242. A Study of Different Methods for the Preparation of *B. typhosus* Antigen.** MOTOMATSU MATSUMOTO. *J. Immunol.*, Balt. & Cambridge, Eng., 1920, 5, 111-131.

Nine antigens prepared from a single strain of *B. typhosus* by different methods showed well defined differences as to antigenic sensitiveness when tested with rabbit sera immunized to the same strain. Antigens prepared from living or dead suspensions of bacteria in salt or culture broth were most antigenic, those obtained by suspending the powder of dried and ground bacilli in salt next best in antigenic sensitiveness, and an antigen prepared from the filtrate of bacilli autolysed in distilled water and heated at high temperature proved least antigenic. The antigen that proved uniformly the most antigenic was a 14-day broth culture killed by heating at 60°C. for 1 hour and preserved with 0.5 per cent phenol.

If kept near the freezing point all the antigens preserved their properties for at least 6 weeks. The anticomplementary activity of the various antigens was slight, and did not differ to a marked extent. The hemolytic activity was marked, however, especially in those antigens in which the products of the bacteria were included.—R. R. H.

**2243. Germ Free Filtrates as Antigens in the Complement Fixation Test.** WILLIAM S. GOCHENOUR. *J. Agric. Research*, Wash., 1920, 19, 513-515.

Data presented indicate that blackleg filtrates produced under proper conditions have a "distinct antigenic value demonstrable by the complement fixation test." When a "solid immunity" in calves was produced the filtrate "possessed a high antigenic titre."

Botulinus filtrate also acted as an antigen when serum and filtrate of the same type were used making the complement fixation test valuable to determine a previous contamination with anaerobes.—G. J. H.

**2244. Verzögertes Auftreten von Typhusimmunistoffen, besonders Agglutinin bei zwei Kindern einer Familie. (Retarded Appearance of Typhoid Immune Bodies, Especially Agglutinins, in Two Children of One Family.)** HÜNE AND O. BULLE. *München. med. Wchnschr.*, 1920, 67, 1011-1012.

Absence of agglutination after repeated trial does not exclude the presence of typhoid fever. If the clinical symptoms of typhoid are present, even though the Widal reaction be negative, the usual precautions and treatment should be instituted. These principles are brought out in the two cases described.—B. C.

**2245. A Study of the Precipitin Test in Cases of *Pneumococcus* Empyema.** CLEVELAND FLOYD. *J. Immunol.*, Balt. & Cambridge, Eng., 1920, 5, 321-335.

This is a study of 22 cases (detailed observations on each case are given) of empyema in the nature of observations on the presence of demonstrable precipitins and their fluctuation in the exudation; together with the effect upon them of the introduction of appropriate immune serum. Pus was obtained from the chest following operation, the organism typed and the presence of precipitin sought for. Subsequently the chest cavity was irrigated with salt and 4 ounces of equal parts of appropriate immune serum and saline solution were put into the chest. No bad effects were noted from the introduction of the serum. The types of pneumococcus found were chiefly I and IV. Two cases of Type II and no Type III were found. The conclusion is reached that the presence of precipitin in the exudation of empyema is a favorable prognostic sign; that the amount of agglutinin, demonstrable in the exudation is often very small; that phagocytosis runs a parallel course with pleural resistance; that the pleura clears itself of a pneumococcus infection in a much shorter time by exclusion of the secondary invaders and that pleural irrigation with an appropriate immune serum is suggested as a means of treatment in order to increase locally those immune substances that tend to limit the duration of the infection.—R. R. H.

**2246. The Complement Fixation Test for Tuberculosis.** HASSOW O. VON WEDEL. J. Immunol., Balt. & Cambridge, Eng., 1920, 5, 159-222.

Complement fixation tests made on 1207 sera from 1000 patients involving 6128 tests show that a considerable percentage of serum from incipient and far advanced cases contain insufficient antibodies to fix complement no matter what system or what antigen is employed. The test is confirmatory rather than diagnostic in the largest percentage of cases. The aid the test can lend to the general practitioner as confirmatory and as an aid in diagnosis and prognosis justifies its more extended use. A review of the literature together with conclusions as to the best method in performing the test as made by comparative studies are given. The writer concludes that one hour fixation at 37°C. is the optimum time and temperature for the antigen employed. Complement pooled from 6 or more guinea pigs gave satisfactory results. No cross fixation was apparent between syphilitic antibodies and the antigens employed from the tubercle bacillus. The von Pirquet reaction did not parallel the results obtained with the complement fixation test.—R. R. H.

**2247. Complement Fixation in Tuberculosis and a Comparison of the Wassermann and Hecht-Weinberg-Gradwohl Systems.** J. B. ROGERS. J. Infect. Dis., Chicago, 1920, 27, 101-105.

This is a report of 635 complement fixation tests on 570 patients. The author found that antigens prepared in various ways from tubercle bacilli have a high anticomplementary titer and that a serious difficulty in the test is the close relation between the anticomplementary value and the amount of antigen necessary for complete fixation. The most satisfactory antigen was found to be emulsions of living virulent organisms.

By parallel tests with the Hecht-Weinberg-Gradwohl system, it was found that no relation exists between negative reactions and the power of serums of patients to hemolyze sheep erythrocytes.—S. B-J.

**2248. The Complement Fixation Reaction in Tuberculosis: Reporting Six Thousand Five Hundred Reactions.** W. WARNER WATKINS AND CLARENCE N. BOYNTON. J. Am. M. Ass., Chicago, 1920, 75, 933.

The complement fixation test in tuberculosis may be efficiently carried out by use of the Miller antigen. The reaction is positive for tuberculosis. When the Wassermann and tuberculosis fixation tests are both positive they should be interpreted without relation to each other. Negative fixation reaction indicates absence of tuberculosis, excessive activity of the disease, or arrest of the disease. Positive reaction indicates tuberculosis, which may be active at the time of test or recently active.—P. G. H.

**2249. The Value of the Complement-Fixation Test in Tuberculosis.** ROY UPHAM AND A. J. BLAIVAS. J. Lab. & Clin. M., St. Louis, 1920, 5, 784-790.

The object of the authors was to determine which is the most delicate antigen and to interpret the laboratory findings. They employed the antigens of Petroff, Miller, and Fleisher-Ibes, using the usual technic and the Hecht-Weinberg modification. The latter gave a higher percentage of positive reactions in clinical tuberculosis, tuberculosis suspects and cases with a diagnosis other than tuberculosis.

The authors are continuing their work, the number of cases so far tested being too few to allow any definite conclusions to be drawn.—F. W. H.

**2250. Réaction de Bordet-Wassermann et syphilis chez les nourissons, leurs mères, et les femmes en État de gestation.** (The Wassermann Reaction and Syphilis in Infants, Their Mothers and Women in the Period of Gestation.) P. NOBÉCOURT AND H. BONNET. Presse méd., Par., 1920, 28, 745.

To avoid anticomplementary serums, blood was drawn from infants by scarification and cupping at least 6 hours after regular feeding. The Hecht reaction was used as a control, titrating for anti-sheep amboceptor and adding it if deficient. The Hecht and Wassermann results agreed almost perfectly, the former picking up an occasional old treated case.

In the mothers, there were more positives in the seventh than in the fourth to the sixth month of gestation. In practically 90 per cent of the instances in which both mother's and child's blood was examined, there was agreement of reaction. The majority of discrepancies were positive mother-negative child reactions, attributed to post-conceptional syphilis. Negative reactions were taken to exclude syphilis (usually consistently negative) and the percentage of positive reactions in clinically diagnosed cases is not stated. The value of the reaction in diagnosing lues in cachectic infants is emphasized.—L. A. K.

**2251. Zur Serodiagnostik der Syphilis.** (The Sero-Diagnosis of Syphilis.) LUDWIG NEUFELD. Berl. klin. Wchnschr., 1920, 57, 419-422.

It appears likely that there are two substances involved in the complement fixation in syphilis, one of which presumably finds its origin in the causative organism and the other arising from the breakdown of protein.—B. C.

**2252. Die praktische Bedeutung der Sero-Diagnostik der Syphilis mittels Ausflockung nach Meinicke und nach Sachs-Georgi.** (Diagnosis of Syphilis by the Meinicke and Sachs-Georgi Reactions.) WALTHER GLOOR. Schweiz. med. Wchnschr., 1920, No. 24, 466.

Comparative studies of the Meinicke, Sachs-Georgi, and Wassermann reactions showed the following percentages of agreement:

Primary syphilis	
Wassermann reaction agreed with.....	{ Meinicke in 88.5 per cent Sachs-Georgi in 91.4 per cent
Secondary syphilis	
Wassermann reaction agreed with.....	{ Meinicke in 93 per cent Sachs-Georgi in 97.8 per cent
Tertiary syphilis	
Wassermann reaction agreed with.....	{ Meinicke in 92 per cent Sachs-Georgi in 96 per cent
Latent syphilis	
Wassermann reaction agreed with.....	{ Meinicke in 87.5 per cent Sachs-Georgi in 90.5 per cent
Cases assumed to be negative	
Wassermann reaction agreed with.....	{ Meinicke in 93 per cent Sachs-Georgi in 95 per cent —G. H. S.

**2253.** *Ueber die Sachs-Georgische Ausflockungsreaktion. (The Sachs-Georgi Flocculation Reaction.)* LEO KUMER. Wien. klin. Wchnschr., 1920, **33**, 562-564.

In an examination of 1245 sera there was over 90 per cent agreement between the Sachs-Georgi reaction and the Wassermann. The Sachs-Georgi reaction should serve as a useful control to the Wassermann.—B. C.

**2254.** *Beitrag zum Wesen der Sachs-Georgischen Reaktion. (The Nature of the Sachs-Georgi Reaction.)* M. MANDELBAUM. München. med. Wchnschr., 1920, **67**, 962.

Blood serum from which the globulin has been precipitated by bubbling through CO<sub>2</sub>, still reacts with the Sachs-Georgi technic in the same way that the untreated serum does. Fresh unheated serum sometimes yields a false positive test which is however not due to complement. It is therefore recommended that serum heated at 56°C. for 30 minutes be used for the test. It is believed that the serum constituent involved in the reaction is not albumin or globulin, but the lipid group.—B. C.

**2255.** *Untersuchungen mit den von Meinicke angegebenen Luesreaktionen, M. R. und D. M. (Studies of the Meinicke Syphilis Reactions: M. R. and D. M.)* O. BLASIUS. Deutsche med. Wchnschr., Berl. & Leipz., 1920, **46**, 854-856.

As a result of 1104 tests, it is concluded that both of Meinicke's reactions, and especially the third modification (D. M.) are highly desirable and valuable as parallel tests or substitutes for the Wassermann reaction. There was over 95 per cent agreement between them.—B. C.

**2256.** *Der Wert der Mastixreaktion unter den Kolloidreaktionen des Liquor cerebrospinalis. (The Value of the Mastic Reaction among the Colloid Reactions of Cerebrospinal Fluid.)*

FELIX STERN AND FRITZ POENSGEN. Berl. klin. Wchnschr., 1920, **57**, 634-636.

How far may the mastic reaction replace the gold sol reaction in the diagnostic examination of the cerebrospinal fluid? Details of the technic are described. Examinations were made in 225 cases comparing both reactions. The mastic reaction has not the same diagnostic value as the gold sol. Whether there are precipitation curves specific for certain diseases is a point that must be considered with much circumspection.—B. C.

## SERUM THERAPY

(See also Numbers 2213, 2214, 2228)

**2257.** *Les accidents des injections intraveineuses de sérum thérapeutique possibilité de les atténuer par l'adjonction de chlorure de sodium. (Accidents in Intravenous Serum Therapy. The Possibility of Avoiding Them by the Use of Sodium Chloride.)* P. BRODIN. Presse méd., Par., 1920, **28**, 807.

Anaphylactic shock following immediately upon intravenous injection of curative serums may be avoided by diluting the serum with nine times its volume of physiological salt solution. Dilution with distilled water or isotonic sugar solution has no similar action. In animals, the antecedent administration of sodium chloride prevents subsequent reaction to the undiluted test dose. Twenty cases of pneumonia so treated gave no reaction. The method has no influence on the subsequent thermal (curative?) reaction.—L. A. K.

**2258.** *An Outbreak of Botulism at St. Anthony's Hospital, Oakland, California, in October, 1920.* J. G. GEIGER. Pub. Health Rep., Wash., 1920, **35**, 2858-2860.

An outbreak of 6 cases of botulism probably due to the eating of spoiled canned spinach is described. Two of the cases were considered mild and 4 severe. Of the latter, 3 died. Treatment with a composite Type A and B serum was used in 3 cases, 2 of which were severe. One of the severe cases died, and the other recovered, though treatment was not begun until 3 days after onset.—I. A. B.

**2259. Preparation and Standardization of Polyvalent Pneumococcic Serum.** N. S. FERRY AND EMILY BLANCHARD. J. Lab. & Clin. M., St. Louis, 1920, 6, 23-24.

The authors produced their serum by inoculating horses already giving a high titre of Type I serum with Types II, III and IV, using the regular schedule of injections as recommended for Type I. The polyvalent serum thus produced had very marked protective properties against Types I, II, and III and against the strains of Type IV used as antigens. The polyvalent serum was standardized against all types, using the method required by the Hygienic Laboratory for Type I serum.—F. W. H.

**2260. Traitement des complications gonorrhéiques par du sérum antigonococcique, réuni à des moyens fébrifuges.** (*Treatment of Gonorrheal Complications by an Antigonococcic Serum, Together with a Febrifacient.*) J. REENSTIERNA. Svenska Läkaresällsk. Handl., 1920, 46, 39-40.

A polyvalent antigonococcic serum has been prepared by inoculating sheep with living gonococcus cultures, which has been found effective in the treatment of cases of arthritis, epididymitis, prostatitis, affections of the eyes, periurethral infiltrations and infiltrations of the Bartholin glands. Beneficial effects have been produced in some cases in 5 to 6 hours, which the author ascribes to antitoxic principles contained in the serum. Certain other cases were found refractory to treatment or the beneficial effects were transitory. By the use of a febrifacient, such as killed typhoid bacilli in addition to the serum, very satisfactory results were obtained.—I. A. B.

**2261. Ein Serum gegen weichen Schanker, insbesondere dessen Bubonen.** (*A Serum against Soft Chancre, Especially Its Buboes.*) JOHN REENSTIERNA. München. med. Wchnschr., 1920, 67, 895-896.

Repeated injections of dead, and later attenuated, streptobacilli of Ducrey into a ram resulted in the elaboration of an effective antiserum for soft chancre. To increase the therapeutic effect, this antiserum is mixed with a certain amount of a vaccine containing killed fever-producing organisms, like *Bact. typhosum*. It has been observed that a febrile temperature is detrimental to the streptobacilli in the body.—B. C.

## ANAPHYLAXIS

(See also Numbers 2193, 2257)

**2262. Hypersensitiveness, Anaphylaxis and Allergy.** ARTHUR F. COCA. J. Immunol., Balt. & Cambridge, Eng., 1920, 5, 363-372.

Restrictive definitions of the terms in general use in the literature on the subject are given and the known phenomena of peculiar physiological reaction are classified in accordance with these definitions. The writer concludes that if anaphylaxis does occur in man, it does so only very rarely and there is no positive evidence that anaphylaxis occurs at all in human beings.

1. Hypersensitiveness is a condition of specific or particular reactivity, with characteristic symptoms, to the administration of or contact with any substance in a quantity which to most of the individuals of the same species is innocuous.

2. Anaphylaxis is a state of true hypersensitiveness that is due to the presence, in certain tissues, of specific antibodies. The symptoms of anaphylaxis are caused by the meeting of these antibodies with the respective antigen in these tissues.

3. Allergy is a natural inherited condition of hypersensitiveness, which affects only human beings and is not dependent in any way on immunological antibodies.—R. R. H.

**2263. Anaphylaxis.** H. H. DALE. Johns Hopkins Hosp. Bull., Balt., 1920, 31, 310-319.

The author gives briefly an analysis of the effects of intravenous injections of histamine into various species of animals and their resemblance to anaphylactic shock and the reaction to a large class of protein poisons. He then reviews rapidly what is known concerning the anaphylactic condition and the events leading to the appearance of the symptoms and cites the evidence for and against the identity of the anaphylactic antibody to the precipitin. He briefly refers to the production of toxic serum by digesting it with various substances and the explanations of this phenomenon that have been offered. He notes the evidence in favor of the conception which relates the anaphylactic condition to a location of the antibody in the cells and which attribute immunity to an excess of the antibody in the blood. The author believes the explanation of the anaphylactic phenomena which is most economical of hypothesis is that which assumes them to be brought about by a change in the state of aggregation of the colloids of the cells occurring when specific precipitating antibody there meets its homologous antigen; and also that explanation of the action of histamine and other substances producing similar effects assumes the least which ascribes it to the production of a change in the state of aggregation of the protoplasmic colloids.—F. W. H.

**2264. Studies in Anaphylaxis. The Relation of Certain Drugs to the Anaphylactic Reaction, and the Bearing Thereof on the Mechanism of Anaphylactic Shock.** MAURICE I. SMITH. J. Immunol., Balt. & Cambridge, Eng., 1920, 5, 239-257.

The experiments are based on an observation that quinine injected into sensitized rabbits at various periods during the incubation interval had no effect. However, if the drug is

given about a half hour before the reinjection of the foreign protein to which the animal is sensitive, a dose which ordinarily produced but slight reaction now causes grave symptoms of shock, often terminating fatally. Rabbits and guinea pigs sensitized to ox or horse serum have their susceptibility increased from 3 to 10 times to the specific protein as compared to the controls. The reaction cannot be referred to the well known action of this drug on ferments as proteolysis could not be demonstrated *in vitro* by treating sensitized serum with the specific antigen, whether incubated alone or with quinine. The phenomenon is not due to any synergy between quinine and the anaphylactic process on the pulmonary circulation as the drug when added to Ringer-Locke solution and perfused through the pulmonary vessels of sensitized or normal rabbits does not cause any noticeable constriction of these vessels. It does not appear that histamine is identical with the anaphylactic process, however a synergistic relation is shown to exist between histamine and the specific foreign protein in sensitized guinea pigs probably best explained on the assumption that some points of attack of histamine and of the anaphylactic process are identical.—R. R. H.

2265. *Studies in Anaphylaxis. I. On the Quantitative Reaction of Partially Neutralized Precipitin in Vitro and Vivo.* ARTHUR F. COCA AND MITSUJU KOSAKAI. J. Immunol., Balt. & Cambridge, Eng., 1920, 5, 297-319.

The writers put to test a conclusion reached by Weil, namely that the interaction of precipitin and precipitinogen is different *in vivo* and *in vitro*. Guinea pigs were sensitized passively with a precipitating immune rabbit serum and after partial desensitization with varying amounts of antigen, to determine the minimal fatal dose of the latter in the partially desensitized animals; on the other hand, immune serum and antigen corresponding with those used in the animal experiments were mixed in test tubes and the resulting precipitate removed by centrifugation. The minimal precipitating amount of the antigen with the supernatant fluid was then determined. The supernatant fluid was also injected into a series of guinea pigs and the minimal lethal dose of the antigen was determined for the animal so treated. A comparison of the results of these parallel tests will show whether the interaction of precipitin and precipitinogen is different *in vivo* and *in vitro*. The antigens used were pseudoglobulin of horse serum and crystalline albumin from egg white. The experiments show that precipitin remains unaltered quantitatively and qualitatively in the guinea pig for several days and that it reacts in the animal body with its antigen in exactly the same manner as it does in the test tube. It would seem as if precipitin and "sensitizin" are identical.

II. On antisensitization. Weil observed that a previous injection of the normal heterologous serum produced a condition of resistance to passive sensitization with heterologous immune serum. This phenomenon of antisensitization Weil believed due to the action of anti-antibodies. If this is true it should be possible to demonstrate a corresponding interference with passive sensitization when the immune serum, previous to its injection, is mixed with an anti-immune serum. It should also be possible to show that this interference is actually due to the specific precipitation (neutralization) of the sensitizing antibodies. Using rabbit serum immune to egg albumin and guinea pigs as the test animals following essentially the technic of Weil's curative experiment the conclusion is reached that the phenomenon of "anti-sensitization" is not due to the action of anti-antibodies. It is a non-specific effect, the nature of which is obscure.

III. Experiments with specific precipitates. Guinea pigs were injected with the washed precipitate from egg albumin with its specific precipitating immune rabbit serum after the technic of Weil. Three days later a test injection of egg albumin was given intravenously. None of the animals gave any symptoms of anaphylactic shock. In these experiments Weil was usually successful. The sodium carbonate extract or solution of specific precipitates does not contain free antigen but represents the whole precipitate in solution.—R. R. H.

## VACCINE THERAPY

(See also Numbers 2051, 2108, 2269, 2319)

2266. *A Nephelometric Method of Estimating the Number of Organisms in a Vaccine.* G. C. DUNHAM. J. Immunol., Balt. & Cambridge, Eng., 1920, 5, 337-343.

A new method of estimating the number of bacteria in a vaccine, involving the use of a Kober nephelometer has been found superior to the two older methods (microscopical count and measurement of opacity of the bacterial suspension as compared with the opacity of a bacterial or chemical standard), since errors caused by differences in the acuteness of vision of different observers and variations in the color of the suspensions can be eliminated. Standards consisting of bacterial suspensions in normal salt to which antiseptic has been added give most satisfactory results. To carry out the determination 10 to 12 cc. of the standard for that vaccine are placed in the cup on the left side of the instrument. Raise cup until vernier on left side is set at 20 mm. Place proper dilution of vaccine to be counted on the right side. Raise cup until the light reflected through the eyepiece from the bacteria in the two suspensions is exactly equal on both sides of the field. The depth of suspension can then be read on the right vernier scale. Since the concentration of the unknown suspension is not exactly inversely proportional to the readings of the scale the correction may be supplied according to the equations of Kober. It is more practicable however to use a nephelometric curve. To construct the curve, set the left cup containing the standard at 20 mm. Various



dilutions such as 0.9, 0.8, 0.7 and 0.6 of the standard are read against the undiluted standard. Plot readings on cross section paper and draw curve through the established points. The curve may be used for all future work with that standard. Before each series of readings, the standard should be read against itself and the vernier scale on the right adjusted so that the light reflected from one suspension matches that reflected from the other when both scales are set at 20 mm. When this is done, the original curve is applicable.

Dilute the vaccine to be counted so that the readings will come within the limits of the curve. For example: Assume that a vaccine, diluted one part in four, gives a reading of 24.7 mm. on the scale; reference to the curve for this vaccine shows that this reading represents 0.75 of the concentration of the standard (2000 million bacilli per cubic centimeter) or 1500 million bacilli per cubic centimeter. This figure multiplied by four gives 6000 million bacilli per cubic centimeter, which is the concentration of the original vaccine.—R. R. H.

**2267. An Experimental Study of the Effect of Autogenous *B. coli* Vaccines on the Intestinal Colon Bacilli of Dogs.** J. C. TORREY AND A. H. RAHE. *J. Immunol., Balt. & Cambridge, Eng.*, 1920, 5, 133-143.

Four normal dogs were used in this experiment in an attempt to reduce or eliminate certain strains of *B. coli* naturally occurring in their intestines, in the hope that the results might throw some light on the use of autogenous *B. coli* vaccines as a therapeutic measure in the treatment of such conditions as eczema and chronic intestinal toxemia. The dogs were kept on a constant diet of boiled rice and boiled beef hearts in the ratio by weight of 2 to 1 as this diet is favorable for the development of an intestinal flora dominated by *B. coli*. Advantage was taken of the fact that all organisms belonging to the colon group ferment lactose but only certain varieties split sucrose. The bacteriological determination was made from fecal specimens in suitable dilutions on Endo plates, the sucrose fermenting strains appearing as red colonies, those not splitting sucrose giving rise to white colonies. The sucrose fermenters were selected and preliminary examinations for each animal were made over a period of 4 to 6 weeks to get, not only the average ratio and the degree of variation in the comparative prevalence of the red and white colon colonies for the normal animal, but also for the selection of representatives of the main cultural variants of the sucrose-positive *B. coli*. A vaccine was prepared with representatives of the main cultural variants of the sucrose-positive *B. coli* and rabbits were immunized for the production of a specific anti-serum. A series of vaccine inoculations were given and cultural examinations made at frequent intervals. At each plating 10 well isolated red colonies were transferred to agar slants and agglutination tests made with the serum from the rabbit inoculated with the vaccine cultures. The anti-serum had a titre of 1:5,000 to 1:10,000 for each of the vaccine cultures. It was found possible to effect a temporary suppression of a certain variety of *B. coli* normal to the intestinal tract of dogs through inoculation with the specific vaccine. Autogenous vaccines are apparently necessary and the dosage must be large. The cultural results indicate a decrease in the numbers of the type of *B. coli* concomitant with a rise of specific antibody in the blood.—R. R. H.

**2268. The Relation of Sputum Bacteria to Asthma.** FRANCIS M. RACKEMANN. *J. Immunol., Balt. & Cambridge, Eng.*, 1920, 5, 373-377.

A study of 40 cases of asthma was made in an attempt to place the vaccine treatment on a more definite basis. Twenty-four hour dextrose broth cultures from isolated colonies (that had been streaked from sputum on blood agar plates) were washed 3 times with saline containing 0.5 per cent carbolic acid, afterwards suspended in same and heated to 56°C. for one hour. Dilution was then made so that 1 cc. contained 500,000,000 organisms. Of the 129 organisms isolated it was found that those most numerous in the sputum of asthmatics were the nonhemolytic streptococci which made up 75 per cent. Intradermal tests with pure vaccines from these organisms were made by injecting 0.02 cc. in the usual manner. Positive early tests gave urticarial wheal surrounded by erythema; positive late tests resembled an inflammation with an area of redness, swelling and slight tenderness. There were 20 positive tests to an autogenous vaccine and 15 to a heterologous vaccine. In 17 additional patients tested only with small doses of pure vaccine at seven-day intervals, dosage being regulated by local reaction from the previous dose, resulted in a definite improvement after 5 or 6 doses in successful cases; the improvement has been retained for 7 months. By analogy to ragweed pollen asthma the assumption is made that asthma due to bacteria depends probably on a condition of specific cellular sensitiveness either to the bacteria themselves or to the products of their action in the organism.—R. R. H.

**2269. Effect of Ultraviolet Rays on Antigenic Properties. I. Studies on Meningococcus.** FREDERICK EBERSON. *J. Immunol., Balt. & Cambridge, Eng.*, 1920, 5, 345-362.

Different types of meningococci subjected to ultraviolet rays showed marked changes in antigenic properties. By agglutinin absorption it is shown that the modifications are attributable to the physicochemical action of the rays. Careful exposures in which the influence of heat was excluded exerted a definite action on the cells, the agglutinin response is favored and the toxic effect of certain organisms is diminished. This effect of ultraviolet rays suggests a method for building up an immunity in animals by injections of bacteria exposed to the rays for constantly diminishing periods of time.—R. R. H.

**2270. Experimental Study of the Sensitized Cholera Antigen.** Y. MIURA. J. Immunol., Balt., & Cambridge, Eng., 1920, 5, 145-154.

Sensitized vaccine in solution is unstable and consequently cannot be kept very long. The writer found that this vaccine could be made in powder form and that it retained its potency and compared favorably in its reactions with the bacillary suspension in liquid, even after a period of 19 months.

Eighteen-hour cultures of cholera bacilli incubated at 37°C. were weighed. To each gram were added 18 cc. of salt solution and 2 cc. of cholera immune rabbit serum (bacteriolytic unit more than 0.0001). After standing, the mixture was incubated at 37°C. for about 2 hours and centrifuged, supernatant liquid decanted, and sediment washed twice with saline. Saline solution containing 0.5 per cent carbolic was added (1 cc. to 2 mgm. bacilli). The suspension was dried in desiccator over calcium chloride *in vacuo* at room temperature for 48 hours. The vaccine becomes a brownish powder. It is stored in sealed ampules. Before use 0.2 mgm. vaccine powder is suspended in 1 cc. saline containing 0.5 per cent carbolic and well shaken.

A comparative study of this vaccine with the ordinary heated vaccine gave practically the same agglutinating and bacteriolytic titre with rabbit immune serums. The same favorable result was obtained in a large series of guinea pigs by treating first with the vaccines and immediately injecting twice the lethal dose of cholera bacilli. The reaction on the part of the human body was very slight after the injection of either vaccine.—R. R. H.

**2271. Active Immunization against Diphtheria.** J. B. SIDBURY. South. M. J. Birmingham, 1920, 13, 474-480.

A general descriptive illustrated article advocating general use of the Shick test in children up to fifteen years of age with toxin-antitoxin immunization in the non-immune. Retests of the non-immune children to whom the toxin-antitoxin mixture had been given showed a reduction at the end of one year from 100 per cent positive to 20 or 30 per cent.—J. H. B.

**2272. Vaccination and Smallpox Mortality.** ANON. Publ Health Rep., Wash., 1920, 35, 2970-2971.

In a smallpox outbreak in Glasgow, Scotland, 477 patients were admitted to hospital of which 128 were children under 15 years of age. Of these 98 were unvaccinated, while the remaining 30 had been vaccinated during infancy. Among the unvaccinated children the death rate was 33 per cent, while none of those vaccinated in infancy died.—I. A. B.

**2273. Bericht über die Ergebnisse der Schutzpockenimpfung in Bayern im Jahre 1917. (Results of the Protective Smallpox Vaccination in Bavaria in 1917.)** ALFRED GROTH. München. med. Wchnschr., 1920, 67, 988-990.

A detailed statistical account is given of virus production, small pox vaccination and its administration in Bavaria.—B. C.

**2274. Zur Frage der Wirksamkeit der Typhusschutzimpfungen. (The Effectiveness of Protective Inoculation against Typhoid.)** A. GALAMBOS. Wien. klin. Wchnschr., 1920, 33, 424-426.

Antityphoid inoculation may play an important rôle, together with other effective means, in reducing typhoid morbidity and preventing the spread of epidemics, but it has not yet been shown to have any direct effect upon the case fatality rate.—B. C.

**2275. Bacterial Vaccines—Chloretone Solution as a Vehicle for Their Administration.** R. G. OWEN, F. A. MARTIN AND W. L. BROSIUS. J. Lab. & Clin. M., St. Louis, 1920, 6, 47.

The authors use a saturated solution of chloretone to wash the bacteria from the agar and to dilute the suspension so that it will contain the proper number of bacteria. They find that there is no clumping of the bacteria such as is produced by tricresol and phenol while the anesthetic properties of the chloretone make the use of such a vaccine very acceptable to the patient.—F. W. H.

**2276. Die Gesetze der Aktivierung durch Verdünnung und Zerlegung, zugleich eine Vertiefung der Vakzinetherapie. (The Laws of Activation through Dilution and Decomposition: An Extension of Vaccine Therapy.)** HANS MUCH. München. med. Wchnschr., 1920, 67, 1005-1006.

By dilution of vaccines, the molecules attain a greater effectiveness. This undoubtedly establishes a relation, despite fantasy and error, to homeopathy in so far as the latter is scientifically pursued. Dilution permits an increase in the motility of the molecules and thus an increase in power and effectiveness. This principle applies to the production of non-specific as well as specific immunity. There are 2 kinds of immunity to be considered, cell and blood immunity, the former being the more important. "Vaccine therapy without highest dilutions, without regard to the law of partial antigens and the law of cell and blood immunity is incomplete and bungling."—B. C.

**2277. Ueber Bakteriotherapie (Vakzinetherapie) bei Grippe-Lungenentzündungen. (Vaccine Therapy in Influenzal Pneumonia.)** KARL BAERTHELEIN AND EUGEN THOMA. München. med. Wchnschr., 1920, 67, 563-566.

Careful examination of genuine pneumonic sputum will reveal certain organisms as being predominantly concerned in the inflammation. These organisms are isolated and an auto-

genous polyvalent vaccine made, which is administered by intramuscular injection. The author has found such a procedure to be exceedingly effective in treatment of lobar and bronchopneumonia following influenza.—B. C.

**2278. Zur Behandlung der Meningitis mit Staphylokokkenvakzine.** (*Treatment of Meningitis with Staphylococcus Vaccine.*) L. SCHÖNBAUER AND HANS BRUNNER. Wien. klin. Wchnschr., 1920, **33**, 491-492.

Two cases of meningitis were treated with a polyvalent staphylococcus vaccine. Injection of this vaccine cannot prevent a severe meningitis from running its course. Light (serous) forms of meningitis are favorably affected by this vaccine therapy.—B. C.

**2279. Behandlung chronischer Gelenkerkrankungen mit Sanarthrit Heilner.** (*Treatment of Chronic Arthritis with Heilner's Sanarthrit.*) RUTH STERN. München. med. Wchnschr., 1920, **67**, 632-634.

Vaccine treatment such as Heilner recommends for chronic joint diseases was not successful in nearly all of the cases reported here.—B. C.

**2280. Immunisierungsversuche gegen Tuberkulose mit massiven Antigendosen.** (*Immunization Tests with Massive Antigen Doses against Tuberculosis.*) UHLENHUTH AND JOETTEN. Deutsche med. Wchnschr., Berl. & Leips., 1920, **46**, 877-879; 901-902.

As a result of a large series of animal experiments carried on over a period of 1½ years, it is concluded that even with massive doses of tubercle and acid-fast bacilli killed in various ways, or with living acid-fast bacilli, no success is obtained in producing an immunity in guinea pigs and rabbits against artificial injection of living tubercle bacilli.—B. C.

**2281. Das F. F. Friedmannsche Tuberkulosemittel. Ueber Fehler bei seiner Anwendung und seiner Beurteilung.** (*The F. F. Friedmann Tuberculosis Remedy. Errors in Its Application and Evaluation.*) A. DÜRRSEN. Deutsche med. Wchnschr., Berl. & Leips., 1920, **46**, 902-904.

The limitations of the Friedmann treatment are discussed in relation to various conditions.—B. C.

**2282. Weitere Erfahrungen mit dem Friedmannschen Heil- und Schutzmittel gegen die Tuberkulose.** (*Further Experiences with the Friedmann Vaccine against Tuberculosis.*) VICTOR BOCK. Berl. klin. Wchnschr., 1920, **57**, 472-473.

On the basis of over 100 Friedmann vaccinations Bock concludes that genuine early cases of tuberculosis are readily curable by the treatment. Permanence of the cure has been established after 6½ years. Where early cases do not respond to the treatment, complicating or intercurrent diseases are to be suspected. When the latter have passed, the tuberculosis will respond to the Friedmann treatment.—B. C.

**2283. Tuberkuloseheilung mit dem Friedmannschen Mittel in Ungarn. Beobachtungen von 1913-14 bis 1920.** (*Cure of Tuberculosis with the Friedmann Vaccine in Hungary. Observations from 1913-14 to 1920.*) ALEXANDER V. BARCZA. Berl. klin. Wchnschr., 1920, **57**, 470-472.

Barcza cites 23 cases in which cure of tuberculosis was effected by the Friedmann treatment. No harmful effects due to injection were noted in any case. If treated early enough, it is claimed that tuberculosis will yield to the Friedmann treatment when other methods fail.—B. C.

**2284. Die Friedmannsche Therapie und Prophylaxe der menschlichen und tierischen Tuberkulose.** (*The Friedmann Therapy and Prophylaxis against Human and Animal Tuberculosis.*) FRIEDRICH FRANZ FRIEDMANN. Berl. klin. Wchnschr., 1920, **57**, 701-706.

The author of the Friedmann treatment for tuberculosis gives in extensive lecture form a statement of the principles underlying his method. Brief case reports are included. A very essential part of successful treatment appears to be that the disease be recognized in its very early stages, and the patient then injected with the vaccine.—B. C.

**2285. Kurze Uebersicht über 230 Friedmann-Impfungen.** (*Brief Review of 230 Friedmann Vaccinations.*) MELHORN. Berl. klin. Wchnschr., 1920, **57**, 473.

The results have been highly satisfactory. The presence of other diseases, as influenza in 1918, makes the Friedmann cure slower and more unsatisfactory.—B. C.

**2286. Zur Behandlung der Lungen- und Bronchialdrüsentuberkulose nach Friedmann.** (*The Treatment of Pulmonary and Bronchial-Gland Tuberculosis according to Friedmann.*) R. GÜTERBOCK. Berl. klin. Wchnschr., 1920, **57**, 468-470.

Since March, 1918, 34 children aged 2 to 16 years have been treated with the Friedmann vaccine. They were definitely tuberculous, and all but 2 showed almost immediate improvement following the injections. Of 24 adults with early tuberculosis, 11 were clearly improved by the treatment. There are some as yet unknown factors in the treatment that make for success or failure, and they apparently reside in the individual cellular activity of each patient.—B. C.

**2287.** *Zur Behandlung chirurgischer Tuberkulose mit Partialantigenen.* (*Treatment of Surgical Tuberculosis with Partial Antigens.*) JOH. E. SCHMIDT. Deutsche med. Wchnschr., Berl. & Leipz., 1920, 46, 846-847.

In conjunction with other forms of treatment, Schmidt injected intracutaneously the much water-insoluble partial antigen (MTbR) and believes cure was accelerated thereby. There are as yet many uncertainties that will have to be cleared up.—B. C.

**2288.** *Die Behandlung chirurgischen Tuberkulosen mit dem Friedmannschen Mittel und ihre Ergebnisse nach 6 Jahren.* (*Treatment of Non-pulmonary Tuberculosis with the Friedmann Vaccine and Results after 6 Years.*) F. KRUMM. München. med. Wchnschr., 1920, 67, 870-872.

Immediately after the announcement of the Friedmann cure for tuberculosis in 1913-14, the author treated rather indiscriminately 52 cases of surgical tuberculosis. Of these, the fate of 47 could be determined in 1920. A great majority of them were cured or very much improved. Krumm believes that the immunity reaction takes a long time to mature in a disease like tuberculosis.—B. C.

**2289.** *Erfahrungen mit dem Friedmannschen Heilmittel bei den verschiedensten Formen der chirurgischen Tuberkulose.* (*Results with the Friedmann Remedy in the Most Varied Forms of Surgical Tuberculosis.*) OTTO SPECHT. Berl. klin. Wchnschr., 1920, 67, 679-682.

Of 72 patients this far treated, 34 appear to be cured, 27 are decidedly improved and 11 are unimproved or worse. It seems clear that in closed gland and testicle tuberculosis, the Friedmann treatment is effective. The indications for application of the treatment require extremely careful study and it is feared that a widespread use of the treatment by general practitioners will result in its falling into an undeserving disrepute.—B. C.

## NON-SPECIFIC THERAPY

(See also Number 2280)

**2290.** *Ueber Albumosetherapie.* (*Albumose Therapy.*) HERMANN LÜDKE. Berl. klin. Wchnschr., 1920, 67, 344-345.

Deutero-albumose, mixed with 15 per cent sodium chloride and some protalbumose was injected intravenously in 5-10 per cent solution in cases of typhoid fever, paratyphoid B, bacillary dysentery, influenza and other febrile diseases. In many, the response was favorable and prompt. This non-specific protein therapy is effective because it causes a "protoplasmic activation." Injection of the albumose produces an artificial crisis with recession of the febrile symptoms. It appears that crisis ordinarily is an anaphylactic process brought about by natural or spontaneous auto-vaccination. In the last analysis, the effect of parenteral introduction of protein substances is a general increase in vitality—an omniscular effect—and the crisis following is merely an expression of this cellular reaction.—B. C.

**2291.** *Die Behandlung der Paralyse mit Malaria- und Rekurrenzfieber.* (*Treatment of Paralysis with Malarial and Relapsing Fevers.*) P. MÜHLENS, W. WEYGANDT AND W. KIRSCHBAUM. München. med. Wchnschr., 1920, 67, 831-833.

A febrile reaction is induced in neuro-syphilitics by the injection of spirochetes of relapsing fever or of malarial parasites. This procedure results in a favorable effect upon the syphilitic infection. It is not clear whether the effect is due to hyperthermia alone or to an immunity reaction aroused by the protozoa.—B. C.

**2292.** *Kann die parenterale Zufuhr des Kaseins auf Grund seiner physikalisch-chemischen Eigenschaften eine besonders starke Proteinkörperwirkung hervorrufen?* (*Can the Parenteral Administration of Casein on the Basis of Its Physico-chemical Properties Call Forth an Especially Strong Protein-Body Effect?*) RUDOLF RIEDEL. Deutsche med. Wchnschr., Berl. & Leipz., 1920, 46, 881-882.

Riedel discusses the principles involved in non-specific protein therapy and suggests a possible mechanism for the phenomena observed. Casein is a representative of the proteins which from its physico-chemical constitution—low glycozell and high tyrosin and tryptophane—and perhaps also its stereo-chemical structure satisfies to a high degree the requirement of easy decomposition after injection.—B. C.

**2293.** *Zur Protoplasmaaktivierung mit Caseosan-Lindig.* (*Protoplasmic Activation with Lindig's Caseosan.*) JULIUS MACK. München. med. Wchnschr., 1920, 67, 983-985.

A report of the results in 48 gynecological cases where Lindig's casein preparation was administered parenterally. The treatment comprised two series of injections. The first consisted of three injections 1 to 2 days apart, and the second series followed 5 days later. In most of the cases, the administration of the casein was followed by a hyperleucocytosis accompanied by a temperature rise, headache and tired feeling. The reactions observed seem to indicate a foreign-body irritation whereby the cells of the organism are stimulated to an increased efficiency.—B. C.

## EXPERIMENTAL INFECTION

(See also Numbers 2227, 2230)

**2294. Rôle de la lésion locale provoquée par les vaccins dans la genèse des anticorps agglutinants.** (*The Rôle of the Local Lesion Produced by Vaccines in the Production of Agglutinating Antibodies.*) C. LEVADITI AND G. BANU. *Presse méd., Par.*, 1920, 28, 735.

The vaccine was prepared as follows: Two 24-hour agar slants of *B. typhosus* were emulsified in 1 cc. of saline, and triturated with 15 cc. of sterile 5 per cent gelatin at 37°C. Five cc. of electrically prepared colloidal mercury (Lelerc) were added; after incubation at 37°C. for 24 hours, the preparation was sterile.

This vaccine, injected subcutaneously over the abdomen in rabbits produced a local reaction the following day, which usually disappeared during the second week. The gelatin serves to limit the spread of the lesion. The extent was carefully marked out on the abdomen of the animals; when it was removed, the operation was a circular excision down to the aponeurosis with linear suture. Subsequently, the extirpated tissue was skinned and ground with sand and saline; left 2 hours at 37°C., overnight on ice, centrifuged, and the supernatant fluid inoculated into rabbits. Agglutinations were with 24-hour broth cultures, and were read after 4 hours at 37°C.

Under these conditions, 3 series of experiments were performed. In the first, it was found that the serum of rabbits from which the area of local reaction was excised from 1 to 7 days after inoculation exhibited agglutinins to the same, or in one case, a markedly higher titre than control animals. The area of reaction contained antigen up to 7 days after inoculation, when injected intravenously into other animals; when administered subcutaneously, little or no response was obtained. In the last series, extirpation of the lesion from 2 to 29 hours after inoculation did not interfere with the production of antibodies.

It is concluded that local inflammation is not essential to and may hinder antibody production; that agglutinins are not produced locally, and that antigen may be demonstrated at the site of injection at a time (7 days after inoculation) when agglutinins are present in some quantity in the circulating blood.—L. A. K.

**2295. The Upper Air Passages as an Environment for Bacterial Growth.** ARTHUR L. BLOOMFIELD. *Am. Rev. Tuberc., Balt.*, 1920, 4, 247-253.

The author smeared cultures of *Sarcina lutea*, *B. coli*, *Staphylococcus albus*, *B. influenzae*, Friedländer bacillus and *Streptococcus hemolyticus* on the tongue, pharynx, nasal septum and into the tonsil crypts of individuals free from unusual abnormalities of the upper air passages. These surfaces were freed of all organisms in a very short time mainly by mechanical means, with no evidence of infection of any kind. These experiments indicate that normal intact mucous membranes of the upper air passages offer an unfavorable environment for the growth and colonization of certain members of both the non-pathogenic and pathogenic groups, and that these surfaces when intact are impervious to invasion by organisms which under other conditions may produce disease. The question is raised if some preliminary "injury" is not essential to the initiation of diseases which clinically appear primary, such as pneumonia, meningitis, tuberculosis and others.—T. G. H.

**2296. Zur Lehre von der Ruhenden Infektion. (Latent Infections.)** GEORG WOLFSOHN. *Berl. klin. Wehnschr.*, 1920, 57, 636-638.

Granulation tissue walling off infected foci no doubt plays a part in the phenomenon of latent infection, but much evidence points to an actual local immunity process as being operative. Mechanical conditions are merely contributory.—B. C.

**2297. Syphilitic Infection of the Central Nervous System of the Rabbit.** W. N. BROWN AND L. PIERCE. *Arch. Dermat. & Syph., Chicago*, 1920, 2, 635-638.

A syphilitic orchitis was produced in a rabbit by the injection of the spinal fluid of another rabbit infected with syphilis. The latter had an orchitis of 8 days' duration thus demonstrating that the nervous system may be invaded at a very early period.—R. D. H.

**2298. Erzeugung chronischer Streptokokkeninfektionen bei Mäusen.** (*Production of Chronic Streptococcus Infections in Mice.*) KARL ALTMANN. *Berl. klin. Wehnschr.*, 1920, 57, 641.

This is a report on hitherto unpublished work performed 10 years ago. Streptococci were administered to mice by stomach sound. Many of the animals succumbed within a few days, but a number survived for a long period with a chronic infection. It is believed that the mode of inoculation as well as the virulence of the organism are factors in the production of chronic infections.—B. C.

**2299. Weitere Versuche über das Kreisen des Vakzinevirus.** (*Further Experiments on the Circulation of Vaccine Virus.*) H. A. GINS. *Berl. klin. Wehnschr.*, 1920, 57, 275-276.

If a rabbit or a guinea pig is injected intravenously with large amounts of calf vaccine virus, and the cornea is later aseptically damaged, a typical vaccine infection of the cornea takes place 3 to 7 days after the injection. Contrary to the Calmette-Guérin experiment, the virus is not demonstrable in the cornea in the first 48 hours after injection. This peculiar behavior is probably due to the small blood supply of the cornea, which brings a correspondingly minute amount of the virus to this tissue.—B. C.

**3300.** *The Passage of Bacteria from the Urinary Bladder into the Blood Stream.* J. A. H. MAGOUN, JR. J. Urol., Balt., 1920, 4, 379-382.

In a series of experiments to determine the absorption through normal and inflamed bladder mucosa of dogs, it was found that *B. prodigiosus*, a non-pathogenic organism, did not readily penetrate but there is a selective absorption of certain dyes which is under further observation.—R. D. H.

**3301.** *The Fate of "Washed" Spores in Animals.* F. H. TEALE AND E. BACH. J. Path. & Bacteriol., 1920, 23, 315-336.

When injected in various ways, intravenously, subcutaneously, intraperitoneally, etc., the washed spores of such organisms as *B. welchii*, *B. tetanus*, *B. botulinus*, and *B. anthracis*, are rapidly phagocytosed and destroyed. A few usually germinate and are slowly destroyed without producing symptoms of infection or toxemia. They do not appear to multiply. When, however, certain reagents, such as acids, alkalies, calcium salts are injected, fatal results are obtained with the washed spores. The simultaneous injection of other bacteria, not in themselves infectious, also cause fatal infection with the washed spores. At the same time cultures of emulsions of various tissues and organs show no evidence of the multiplication of the injected spores. The conclusion of the authors is that bacterial toxemia is produced as a result of interaction between the bacterial protein and the tissue cells. When bacteria are born in the tissues from washed spores this interaction does not take place and toxemia does not occur. Reagents which destroy this state of equilibrium lead to the production of toxemia; interactions occur between the bacteria and the cells of the host, leading to damage of the latter and formation by these tissues of toxic products, in the same way as toxic products arise from damage to muscle tissue leading to wound shock—a view of bacterial toxemia quite at variance with present conceptions of the subject.—L. C. H.

**3302.** *Zur Frage der Infektionswege der Tuberkulose. (The Problem of the Infection Atrium of Tuberculosis.)* JOS. KOCH AND B. MÖLLERS. Deutsche med. Wchnschr., Berl. & Leipz., 1920, 46, 904-906.

Experiments were performed on rabbits. Tubercle bacilli when placed in the small intestine, very rapidly pass to the regional lymph nodes of the mesentery by way of the chyle ducts and thence to the blood stream. Tubercle bacilli introduced into the stomach do not seem, be able to start an infection or invade the body. The lymph glands and adenoid tissue of the mouth cavity appear to be readily susceptible to direct invasion by tubercle bacilli.—B. C.

**3303.** *Zur Beurteilung einiger zum Schutz gegen die syphilitische Ansteckung empfohlenen Desinfektionsverfahren. (The Value of Certain Disinfecting Procedures Recommended as Protection Against Syphilis.)* PAPAMARKU. Deutsche med. Wchnschr., 1920, 46, 847-849.

Experiments were performed on white mice, the infecting organism being the spirochete of recurrent fever. This mouse spirochetosis is considered comparable to human syphilitic infection. Sublimate solution and salves are more effective in preventing infection if applied before rather than after exposure. Prior application of even indifferent fatty salves assures a certain protection which is greater than that given by a 1:1000 sublimate solution.—B. C.

## CHEMOTHERAPY

(See also Numbers 2050, 2141, 2150, 2174, 2191, 2192, 2202, 2203, 2206, 2305)

**2304.** *Bericht der Salvarsankommission des Allgemeinen Aerztlichen Vereins in Köln. (Report of the Salvarsan Commission of the Cologne General Medical Society.)* MEIROWSKY, Secretary. München med. Wchnschr., 1920, 67, 477-480.

This is a brief compilation of the evidence gained in Germany, Austria, Holland, and Denmark on secondary effects of salvarsan therapy, such as icterus, skin disturbances, nervous disturbances or death. Excessive dosage is the main factor in producing these disturbances. For men, the total dose should not exceed 0.6 gram and for women, 0.45 gram.—B. C.

**2305.** *Ein einfaches Verfahren zur Erkennung von gefälschten Neosalvarsan. (A Simple Procedure for Detecting Adulterated Neosalvarsan.)* A. RÖDEL. Deutsche med. Wchnschr., Berl. & Leipz., 1920, 46, 999-1000.

Neosalvarsan, 1 to 2 cc. of a 10 per cent aqueous solution, is treated slowly with several drops of perhydrol or with 1 cc. of 3 per cent  $H_2O_2$ . A white precipitate results, which soon redissolves producing a strong brownish-red coloration and a garlic odor. This reaction is claimed to be characteristic and sensitive.—B. C.

**2306.** *Zur Kenntnis der gegen Salvarsan refraktären Syphilis. (Salvarsan-fast Syphilitic Infection.)* W. LUTZ. Schweiz. med. Wchnschr., 1920, No. 38, 838-841.

Two cases of syphilis are reported, both of which were refractory to salvarsan. It is shown that in one case the strain of infecting *Tr. pallidum* was not of itself salvarsan-fast under all conditions, or that the arsenic-fast property is an inherited characteristic of the organism, since three individuals infected from the original case proved susceptible to salvarsan therapy.—G. H. S.

**2307. Zur Salvarsanprophylaxe der Syphilis.** (*Salvarsan Prophylaxis in Syphilis.*) A. BRUN. München. med. Wchnschr., 1920, 67, 906.

The general application of salvarsan as a prophylactic against syphilis is advised against. Severe toxic symptoms may arise.—B. C.

**2308. Ueber kombinierte Behandlung der Lues mit Silbersalvarsannatrium und kolloidalem Silber.** (*Combined Treatment of Syphilis with Sodium Silver Salvarsan and Colloidal Silver.*) LENZMANN. Deutsche med. Wchnschr., Berl. & Leips., 1920, 46, 992-995.

Small and frequent injections of (0.05 gram) silver salvarsan are recommended in order to avoid depot formation which might give rise to toxic decomposition of the arsenical. Simultaneous injections of (0.05 to 0.10 gram) collargol are readily tolerated and aid a great deal toward cure.—B. C.

**2309. Ueber die einseitig kombinierte Neosalvarsan-Novasurol Behandlung der Syphilis.** (*Simultaneous Combined Neosalvarsan-Novasurol Treatment of Syphilis.*) CARL BRUCK AND HEINRICH BECHER. München. med. Wchnschr., 1920, 67, 901-902.

Novasurol is a double sodium salt of oxymercurichlorphenoxyl acetic acid and diethylmalonyl urea, containing 39 per cent mercury. Its aqueous solution is neutral and does not precipitate protein. The simultaneous injection of this salt with neosalvarsan has been found very effective in the treatment of syphilis.—B. C.

**2310. Ueber Silbersalvarsan und Sulfozylatsalvarsan.** (*Silver Salvarsan and Sulfozylate Salvarsan.*) FRITZ M. MEYER. Deutsche med. Wchnschr., Berl. & Leips., 1920, 46, 943-944.

Results with these substances are satisfactory in the treatment of syphilis and are to be preferred to the older arsenicals for several reasons. It is possible that mercury treatment may be dispensed with when these substances are available.—B. C.

**2311. Erfahrungen mit Silbersalvarsan.** (*Results with Silver Salvarsan.*) A. STÜHMER. München. med. Wchnschr., 1920, 67, 836-838.

The author finds that silver salvarsan is very effective in early syphilis as the sole therapeutic agent. In chronic cases, combination with mercury is necessary. The Wassermann reaction is favorably affected but does not turn until cure is almost completed. Numerous occurrences of dermatitis appear however after administration of this drug.—B. C.

**2312. Die Syphilisbehandlung mit Hg-Salvarsan.** (*Syphilis Treatment with Hg-Salvarsan.*) CAMILLO ZERN. München. med. Wchnschr., 1920, 67, 1017-1018.

The usually prepared neosalvarsan solution (0.45 gram in 4 to 5 cc. water) is taken up in a syringe followed by 1 to 1.5 cc. of a 1 per cent aqueous solution of  $\text{HgCl}_2$ . The brownish-green cloud formed is distributed throughout the mixture by shaking, and this mixture is injected. Only the pure materials are to be used and mixed just prior to injection. The chemical compound resulting is not known. This new material has shown a number of desirable qualities and its therapeutic value after 2 years has been found good.—B. C.

**2313. Eine quartana-ähnliche Fiebererkrankung durch Neosalvarsan geheilt.** (*A Quartan-like Fever Cured by Neosalvarsan.*) V. TEUBERN. Deutsche med. Wchnschr., Berl. & Leips., 1920, 46, 964-965.

A case is described which possessed a fever curve typical of quartan malarial fever, but blood findings were negative for parasites, and quinine therapy failed. The fact that neosalvarsan treatment produced a cure would indicate this disease to be a spirillosis, or protozoon infection of some kind.—B. C.

**2314. Ueber akute gelbe Leberatrophie, Syphilis und Salvarsan.** (*Acute Yellow Atrophy of the Liver, Syphilis and Salvarsan.*) GOTTHOLD HERXHEIMER. Berl. klin. Wchnschr., 1920, 57, 369-373.

Intensive salvarsan therapeutics has as one of its concomitants a symptom of mild catarrh of the intestinal and hepatic systems accompanied by mild icterus. There is however no evidence that it proceeds further to produce atrophy of the liver and severe jaundice.—B. C.

**2315. Tebelon in der Behandlung der chirurgischen Tuberkulose.** (*Tebelon in the Treatment of Surgical Tuberculosis.*) W. BAENSCH. München. med. Wchnschr., 1920, 67, 1009-1010.

Tebelon is the isobutyl ester of oleic acid which, according to Stoletzner, has antigenic properties toward tubercle bacillus wax. Baensch tested this material therapeutically and found that it has not a very decided specific curative effect. However, the period of treatment of surgical tuberculosis in children seems to be diminished by its use in conjunction with other accepted procedures.—B. C.

**2316. Zur Chemotherapie der Influenza.** (*Chemotherapy of Influenza.*) HANS RYSER. Schweiz. med. Wchnschr., 1920, No. 32, 695-698.

A discussion of the effects of sodium salicylate in the treatment of influenza. The mortality in a group of cases systematically treated with this compound amounted to 2.7 per cent. The use of electrargol, ethylhydrocuprein, isoamylcuprein, and other compounds containing quinine is discussed.—G. H. S.

#317. *Ueber die Behandlung der Maul- und Klauenseuche beim Menschen mit Silbersalvarsan.* (Treatment of Human Foot and Mouth Disease with Silver Salvarsan.) GEORG KRÖNCKE. München. med. Wchnschr., 1920, 67, 870.

A prompt curative effect was obtained in a single case reported of human infection with the virus of foot and mouth disease when treated with silver salvarsan.—B. C.

#318. *Beitrag zur Therapie des Milzbrand.* (Therapy of Anthrax.) BAUMANN. Schweiz. med. Wchnschr., 1920, No. 31, 676-677.

Test-tube and animal experimentation shows that a compound of methylene blue and silver (argochrom) has an elective bactericidal and growth-inhibiting effect upon *B. anthracis*. A case report is presented. In spite of the bacteremia the injection of the antiseptic dye resulted in recovery.—G. H. S.

## BOOK REVIEWS

#319. *Die Partigengesetze und ihre Allgemeingültigkeit.* (The Partial Antigen Laws and Their General Applicability.) HANS MUCH. 1921. Curt Kabitssch. Leipzig.

This publication purports to expound its subject in a manner understandable to the general reader, which may be the excuse for the entire absence of detailed experimental data in support of the author's contentions. This fact may also tend to soften the effect of an extremely didactic style, which to the reader were he a scientific specialist, would scarcely fall short of being offensive. The article may be regarded as a philosophical treatise, as suggested by the caption quotations from eminent philosophers (including himself); as an exposition of a system of therapeutics; and as a protest against the hide-bound conservatism of the schools.

The laws governing the action of partial antigens (presumably discovered by the author are first laid down seriatim. We cannot detail these "laws" in this review, but may summarize their purport. Vaccine therapy and prophylaxis are considered to find their fundamental basis in the fact that immunity in order to be complete must result from the cellular and humoral response to the partial antigens which compose and may be derived (by special procedures discovered but not detailed by the author) from the germs of disease, or in some cases (cancer, for example) from the tissue attacked. On the other hand, these antigens when combined in the killed bacterium do not call forth the production of protective bodies or forces, in suitable kind, concentration or proportion to produce a complete immunity. Most of the present day vaccine therapy and prophylaxis may attribute its failure therefore, to its non-conformity to the "laws." In the light of these laws the current practice of typhoid immunisation, becomes a glaringly unscientific and bungling process whose achievement dubious at best is due rather to accident than to being well grounded.

Immunity is specific and non-specific, and the relative importance of the two kinds in diseases of various types is considered at some length. Of practical significance is the fact that non-specific immunity may be produced or intensified by a vaccine prepared by the author, to a degree which may render specific vaccine therapy superfluous.

The scientific use of partial antigens is based upon the need of the body for the particular corresponding antibodies, and this is determined by intracutaneous tests as regards the cellular immunity and by complement fixation tests for the humoral immunity.

One of the tenets of the system is that of high dilution of the partial antigen for administration. They should be diluted apparently to the vanishing point.

In the section dealing with the rationale of the "laws" we must agree with the author that explanation is difficult, but if we accept his philosophical statement that true science is art not knowledge, explanations become of secondary importance. He conceives of the human body as being constantly swept by alternating waves of radio-active oscillations whose state of balance determines health or disease. The germ causes of disease, and their partial antigens also carry radio-active charges, and the interplay of all these in a complexity too profound for the author to fully describe, or frankly, for us to follow, is in some way associated with the "laws."

Of course Much and his work are not unknown to students of immunity, who have doubtless formed their own estimates of both. But if this pamphlet constituted his first introduction, it is safe to say that one or both of two questions would occur to the average student. They would inquire whether this man were not a bombastic charlatan seeking under the cover of a quasi-scientific smoke screen, to advance a veritable armada of commercial ventures in the form of various vaccines and partial antigens. Or they would ask whether, an unfortunately egotistical method of exposition being granted, he really may not have worked out certain principles which the immunologist and the therapist cannot afford to ignore. Of course the burden of proof is on him, but this he has not vouchsafed us in the present article. There are propositions in his system which are attractive and not inherently improbable. Those however, who desire to conduct independent investigations along the lines suggested will doubtless encounter difficulty in the preparation of their reagents. Not only must the partial antigens be pure from a chemical standpoint, but they must at the same time be biologically active, and it is doubtful if sufficiently explicit directions for their preparation have been published. Dr. Much is very bitter in his reference to some critical work performed by another who apparently attempted to prepare his own reagents.—A. M. S.



**3320. Pathologische Biologie. (Pathological Biology.)** HANS MUCH. Dritte Auflage. 1920. Curt Kabitzsch. Leipzig.

This book is a simple, concise, well worded account of immunologic and serologic principles. The author does not go into the theory of immunity in detail but intends the book as a practical manual for physicians and students of the various serologic methods now in common use. He usually gives his own technic which varies in some respects from that commonly accepted. The most noteworthy example is the stress laid on "soluble antigens," the so-called partial antigens and lipoid fractions, developed by Much. The first portion of the book is devoted to a brief account of the different kinds of immunity and the ways in which bacteria resist the destructive action of the tissues and fluids of the host. The larger part of the book is taken up with the methods used in the diagnosis, prevention and cure of disease. At the end there is a brief summary of our knowledge of the different infectious agents common to man and animals. It appears to be a manual well adapted to the needs of physicians, laboratory workers, students and others who wish to gain a convenient working knowledge of immunology and serology without going deeply into theoretical considerations.—L. C. H.

**3321. The Exact Diagnosis of Cancer.** O. C. GRUNER. H. K. Lewis and Co., London, 1919, 79 pp., 19 fig.

A description of a method for diagnosing cancer from examination of the blood. The author's contention that all aberrations in the tissues reflect themselves in the blood will require more proof than he has so far been able to adduce.—W. H. W.

#### MISCELLANEOUS

**3322. Zur Mechanik der Geisselbewegung. (Mechanics of Flagellar Motion.)** P. METZNER. Biol. Centralbl., Leipz., 1920, 40, 4-87.

Studies on wires rotated in water so that they outlined a cone showed that they developed a tractive force which is at the maximum when the angle of the convex surface to the axis of rotation is about  $20^\circ$  to  $23^\circ$ . Spiral wires in which the spirals have a pitch of  $45^\circ$  to  $54^\circ$  theoretically and practically show maximal traction. Very flexible objects assume passive, upon rotation, characteristic spiral forms, the angle of pitch and the diameter of the swing is dependent upon the rate of rotation.

The swing of single flagella will show an elliptical cross-section which may be considerably flattened. The flagella of living cells generally possess the property of contractility at some point of their surfaces and when single and moving slowly, they exhibit complicated movements which in part in their final effects, may be somewhat modified by the water. An especially flexuous and energetic zone is observable as a rule near the point of attachment. A true conical motion predominates among the flagellates, the organisms "suck" themselves along with the assistance of the flagella. In *Chromatium okeni* the flagellum exhibits a corkscrew motion.—R. E. B.

**3323. Die Stalagmone. (Stalagmones.)** H. BECHHOLD AND L. REINER. München. med. Wchnschr., 1920, 67, 891-892.

Stalagmones is the name applied to substances that occur in the urine and reduce its surface tension. They are colloids or semi-colloids of varying size, readily soluble in water, amphoteric or acid, very stable and readily adsorbable. Chemically they are related to the proteins and their split-products, and in some diseases to bile constituents. Tuberculosis causes no variation from the normal stalagmone content of the urine, while nephritis, pyelitis and cirrhosis of the liver show a great change.

The accelerated sedimentation of red blood cells noted in certain diseases is explained as being due to the presence of these stalagmones in the blood stream.—B. C.

**3324. On the Placental Transmission of So-called Normal Antibodies. II. Antitryptic-acting Bodies.** G. C. REYMAN. J. Immunol., Balt. & Cambridge, Eng., 1920, 5, 391-397.

The antitryptic action of the serum of 7 goats and their kids was tested by means of the Gross Fuld method. The titers of the new born kids were in all cases found to be higher than those of the mother. The titer of the mother as a rule increases before parturition. The growth of the kid and the antitryptic-acting power of the blood seem to be connected, so that the titer of the kid decreases when it thrives badly, and increases when it thrives well, which agrees with the supposition of previous experimentors that the antitryptic action is connected with a fat or lipid effect.—R. R. H.

**3325. Studies on Compensatory Hypertrophy of the Thyroid Gland. IV. The Influence of Iodine on Hypertrophy of the Thyroid Gland.** LEO LOEB. J. Med. Research, Bost., 1920, 41, 481-494.

The conclusion is drawn that neither iodine nor its salts exerts an inhibiting effect on the compensatory hypertrophy of the thyroid gland in guinea pigs. There is, on the contrary, some indication that they may perhaps increase the intensity of the hypertrophic changes.

The effect of iodine on compensatory hypertrophy differs, therefore, markedly from that on endemic goiter, and we must conclude that the two conditions are essentially different.

In those experiments in which great parts of the thyroid gland were extirpated, during the summer months, compensatory hypertrophy resulted in a much lower percentage of cases than in experiments carried out in the colder season. This suggests a relation between compensatory hypertrophy and temperature. Further experiments must decide whether this relationship is real or merely a coincident.—A. C. E.

**2326.** *Die Beziehungen der Esophylaxis zur physikalischen Therapie.* (*Relation of Esophylaxis to Physical Therapy.*) WALTER KREBS. Deutsche med. Wchnschr., Berl. & Leipz., 1920, **46**, 852-854.

By esophylaxis is understood the internally directed protective function of the skin (through hormones). The stimulant effect on the skin after application of cold water, etc., is considered to be a 'protoplasmic activation' of the organism due to an actual internal secretion as opposed to the general notion of a nervous effect. This is intimately related to a high or low immunity toward disease in general.—B. C.

**2327.** *Ueber die Senkungsgeschwindigkeit der roten Blutkörperchen bei Gesunden und Geisteskranken.* (*The Sedimentation Rate of the Erythrocytes in Health and in Psychopathies.*) W. RUNGE. München. med. Wchnschr., 1920, **67**, 953-955.

The original observations of Fahraeus are confirmed. The sedimentation rate of the red blood cells in citrated blood from normal women is greater than that from men. Pregnancy increases the rate. A certain proportion of functional psychopathies (dementia-precoc group) seem characterized by an increased sedimentation rate, which is however exceeded apparently in neurosyphilis.—B. C.

**2328.** *The Action of Benzol. VI. Venzol Vapor Leucopenia (Rabbit).* H. G. WEISKOTTEN, C. B. F. GIBBS, E. O. BOGGS AND E. R. TEMPLETON. J. Med. Research, Bost., 1920, **41**, 425-438.

Rabbits were exposed to benzol vapor under conditions somewhat comparable to those existing in industrial establishments. In studying the results special attention was given to the blood cell counts. The study led to the following conclusions:

Exposure of rabbits to benzol vapor with maximal sublethal dosage causes leucopenia, hemorrhages and slight anemia. The percentage and absolute decrease of small mononuclears is greater than that of polynuclear amphophiles. Apparently, after discontinuance of exposure, the total leucocyte curve rises to a permanent general level, lower than that existing before exposure. This relative leucopenia is permanent. It is due to a failure of the absolute small mononuclear curve to rise to as high a level as that existing before exposure. The results of exposure are of the same general nature as those produced by subcutaneous injections of olive oil benzol mixture. Diphasic leucopenia was not observed.—A. C. E.



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AMERICAN BACTERIOLOGISTS

COMPRISING REVIEWS AND ABSTRACTS OF WORK IN  
BACTERIOLOGY, MYCOLOGY AND PROTOZOOLOGY IN  
THEIR RELATION TO THE ARTS AND SCIENCES

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